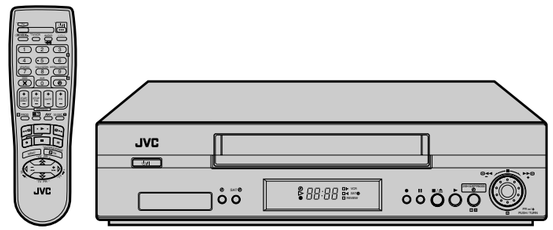
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J680EK/EU, J780EU, J785EK



VIDEO Plus+ DELUXE

SQPB

Hi-Fi VHS PAL

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-J785EK)*

GENERAL

Power requirement	: AC 220 V – 240 V ∿, 50 Hz/60 Hz
Power consumption	: on : 16 W, off : 4.0 W
Operating Temperature	: 5°C to 40°C
Storage Temperature	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 mm x 94 mm x 278 mm
Weight	: 3.4 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: DA4 (Double Azimuth) helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz (Normal audio) 20 Hz to 20,000 Hz (Hi-Fi audio)
Input/Output	: 21-pin SCART connectors (IN/OUT x 1, IN/DECODER x 1) RCA connectors (AUDIO OUT x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF 44.5 MHz – 143 MHz/ 143 MHz – 470 MHz/ UHF 470 MHz – 862 MHz
Aerial output	: UHF channels 22 – 69 (Adjustable)
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable, Satellite Controller, Infrared remote control unit, 'AA' battery x 2

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

JVC
VICTOR COMPANY OF JAPAN, LIMITED
VIDEO DIVISION

S40894

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The following table lists the differing points between Models (HR-J680EK, HR-J680EU, HR-J780EU and HR-J785EK) in this series.

	HR-J680EK	HR-J680EU	HR-J780EU	HR-J785EK
JOG/SHUTTLE	NOT USED	NOT USED	USED	USED
VIDEO SYSTEM	PAL	PAL/MESECAM(MANUAL)	PAL/MESECAM(MANUAL)	PAL
BROADCASTING STANDARD	I	B/G,D/K	B/G,D/K	I
STEREO DECODER	NICAM	NICAM/A2	NICAM/A2	NICAM
RF OUT SYSTEM [INITIAL]	I	G,K	G,K	I
VCR PLUS+	VIDEOPLUS+ DELUXE	SHOWVIEW DELUXE	SHOWVIEW DELUXE	VIDEOPLUS+ DELUXE
LANGUAGE [INITIAL] (ON SCREEN DISPLAY)	ENG	13LANG.[ENG]	13LANG.[ENG]	ENG
AUDIO DUBBING/OPERATION	NOT USED	NOT USED	USED/BUTTON	NOT USED
FRONT VIDEO/AUDIO IN	NOT USED	NOT USED	USED	NOT USED
WINDOW COLOR	SMOKE LIGHT GRAY	SMOKE LIGHT GRAY	BLUE	SMOKE LIGHT GRAY
REMOTE PAUSE	NOT USED	NOT USED	USED	NOT USED
CABLE MOUSE	PROVIDED	OPTION	OPTION	PROVIDED

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded ( ) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape 3) Spacers 5) Barrier
   2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

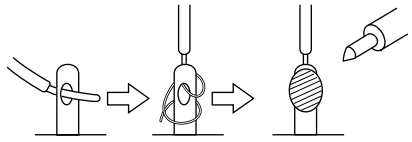


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

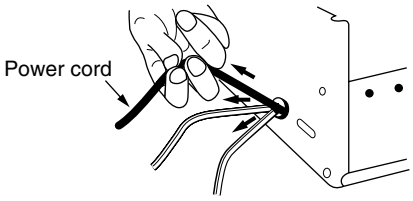


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission.
    Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits.
    Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) Connector part number : E03830-001
    2) Required tool : Connector crimping tool of the proper type which will not damage insulated parts.
    3) Replacement procedure
    (1) Remove the old connector by cutting the wires at a point close to the connector.
    Important : Do not reuse a connector (discard it).

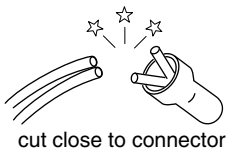


Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

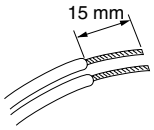


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

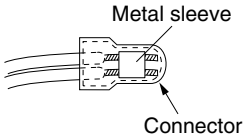


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

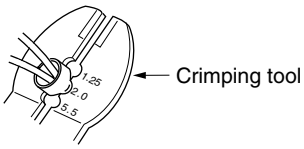


Fig.6

(5) Check the four points noted in Fig.7.

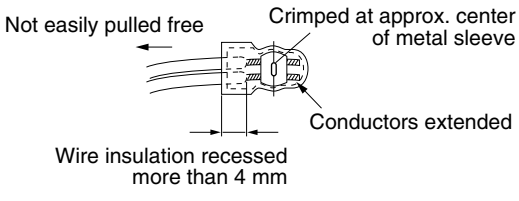

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

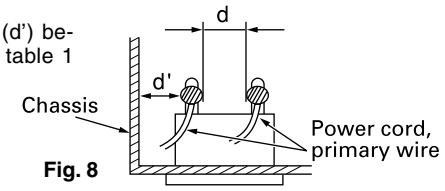


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

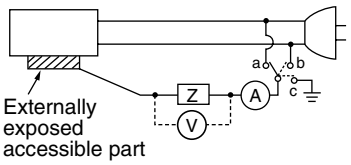


Fig. 9

5. Grounding (Class 1 model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

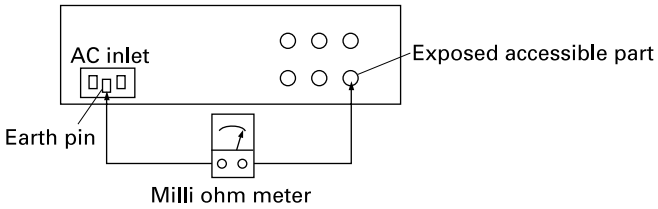


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦ R ≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class Ⅱ) AC 1.5 kV 1 minute (Class Ⅰ)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

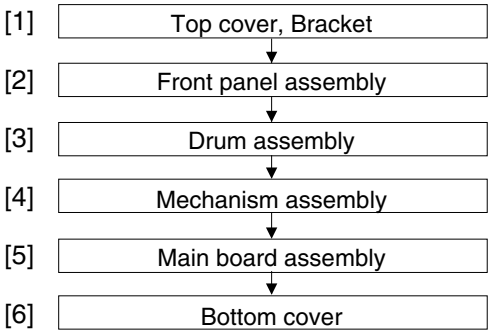
Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 1
DISASSEMBLY

1.1 Disassembly flow chart

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 How to read the disassembly and assembly

<Example>

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover, Bracket	D1	4(S1a),(S1b),3(L1a), 2(SD1a),(P1a),(W1a), CN1(WR1a), 2(S1c)	<Note 1a>

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) No. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig. No. showing procedure or part location.
(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.
P= Spring, W= Washer, S= Screw, L= Locking tab, SD= Solder, CN**(WR**)= Remove the wire (WR**) from the connector (CN**).

Note:

- ***The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.***

(5) Adjustment information for installation

1.3 Disassembly/assembly method

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover, Bracket	D1	4(S1a), (S1b) 2(S1c)	
[2]	Front panel assembly ADV. Jog board assembly	D2	CN7001(WR2a) [HR-J780EU/J785EK], 4(L2a), 3(L2b) 2(S2a)	<Note 2a> <Note 2b> <Note 2c>
[3]	Drum assembly (Drum shield)	D3	CON1(WR3a), CN1(WR3b), (S3a), (S3b), (S3c) 2(S3d)	<Note 2c>
[4]	Mechanism assembly	D4	CN2001(WR4a), (S4a),(S4b), (S4c), (S4d)	<Note 2c> <Note 4a>
[5]	Main board assembly	D5	6(L5a), (S5a), 3(S5b), (S5c)	<Note 2c>
[6]	Bottom cover	D6	2(L6a), 9(L6b)	<Note 6a>

<Note 2a>

- When reattaching the Front panel assembly, make sure that the door opener "a" of the Cassette holder assembly is lowered in position prior to the reinstallation.

<Note 2b>

- When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the switch knob "b" of the Main board assembly from the side.

<Note 2c>

- Be careful not to damage the connector and wire etc. during connection and disconnection.
  When connecting the wire to the connector, be careful with the wire direction.

<Note 4a>

- When it is required to remove the screws (S4a to S4b) retaining the Mechanism assembly, please refer to the "Procedures for Lowering the Cassette holder assembly"(See on page 1-2).
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors on the Main board assembly.
- When removing the Mechanism assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Mechanism assembly.
- The wire (WR4a) has excess length that may be loose, as it is quite long. After inserting the wire and connectors, the loose portion of the wire should be taken up and accommodated between the A/C head base and the main deck.

<Note 6a>

When removing the bottom cover, push down the two tabs (L6a) to slide the bottom cover.

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two screws unscrewed when removing the Mechanism assembly.

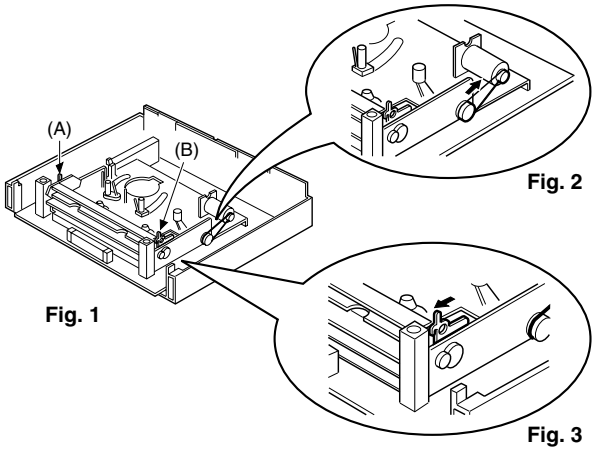


Fig. 1

Fig. 2

Fig. 3

Turn the loading motor pulley in the direction as indicated by Fig.2. As both (A) and (B) levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of (A), (B), (B), (A). When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

Procedures for Lowering the Cassette holder assembly

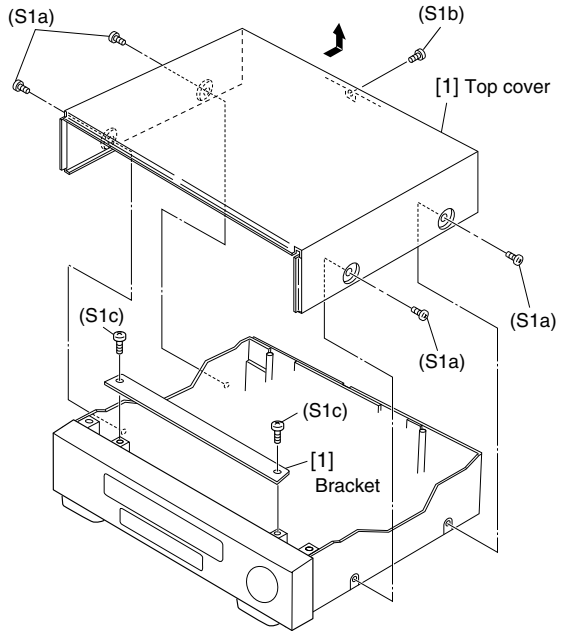


Fig. D1

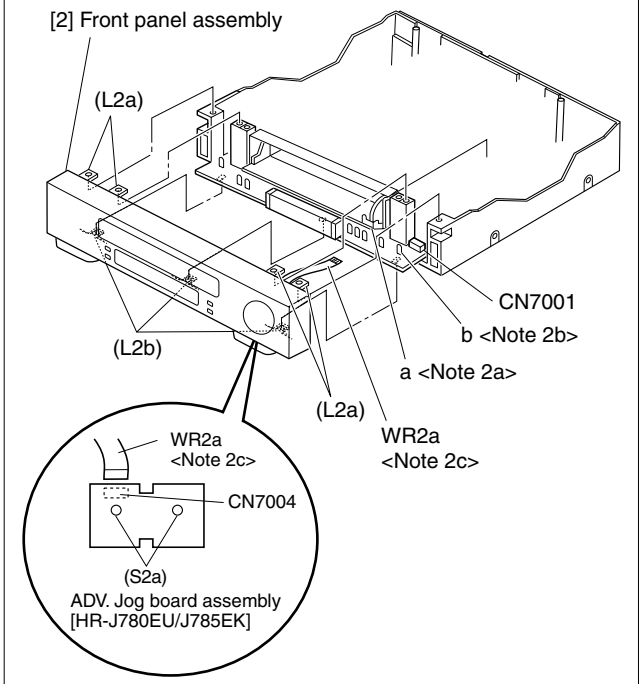


Fig. D2

Note:
When installing the Drum assembly, secure the screws (S3a to S3c) in the order of a, b, c.

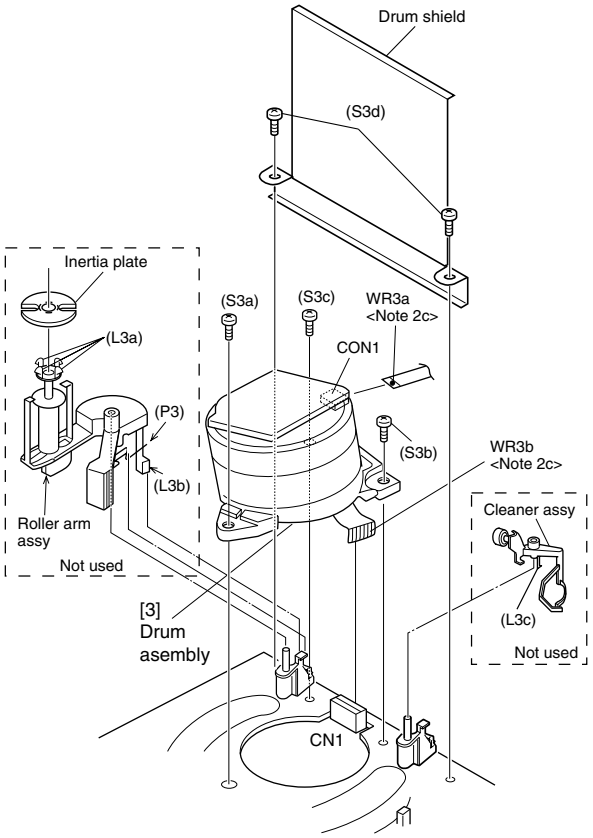


Fig. D3

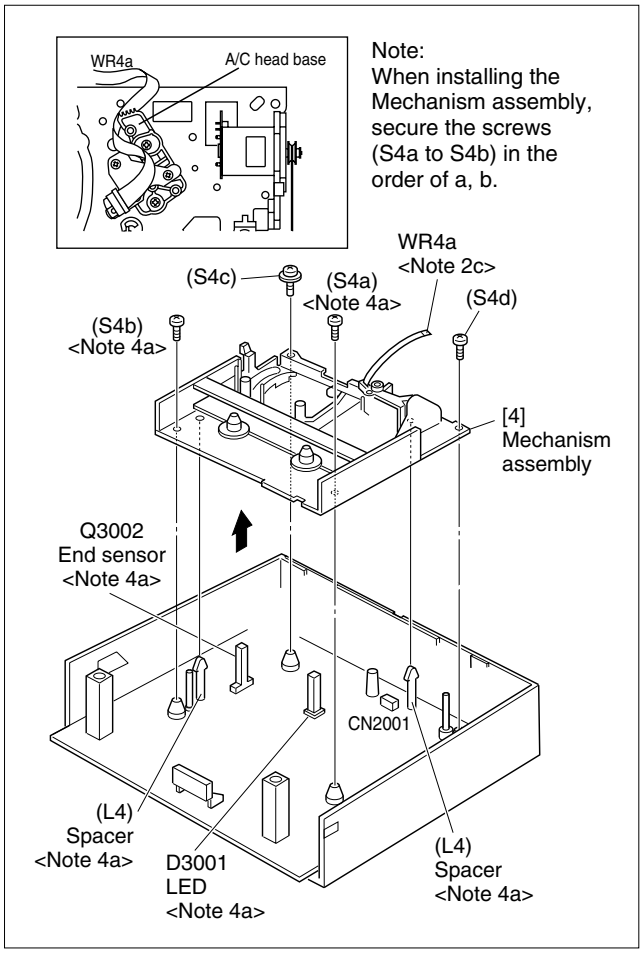


Fig. D4

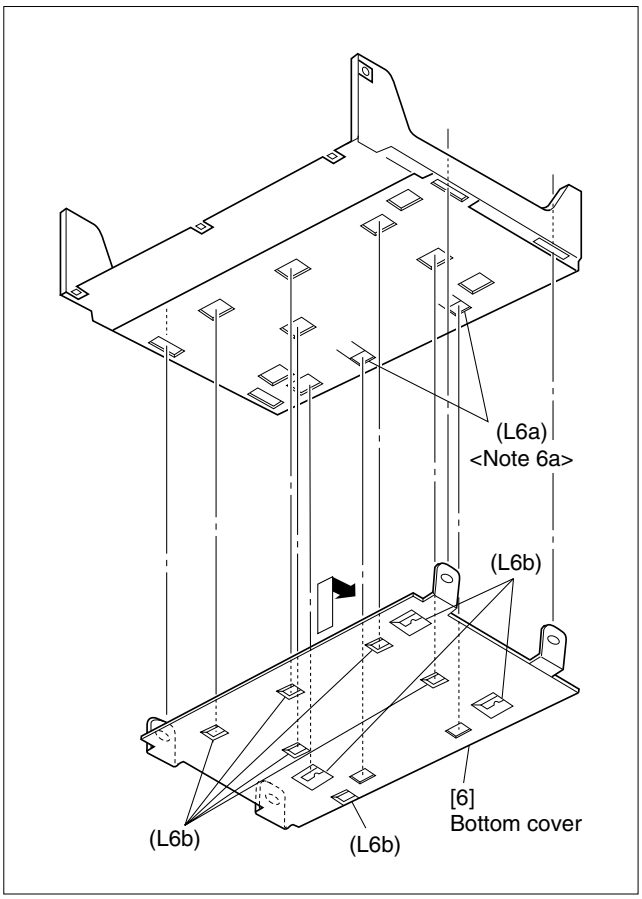


Fig. D6

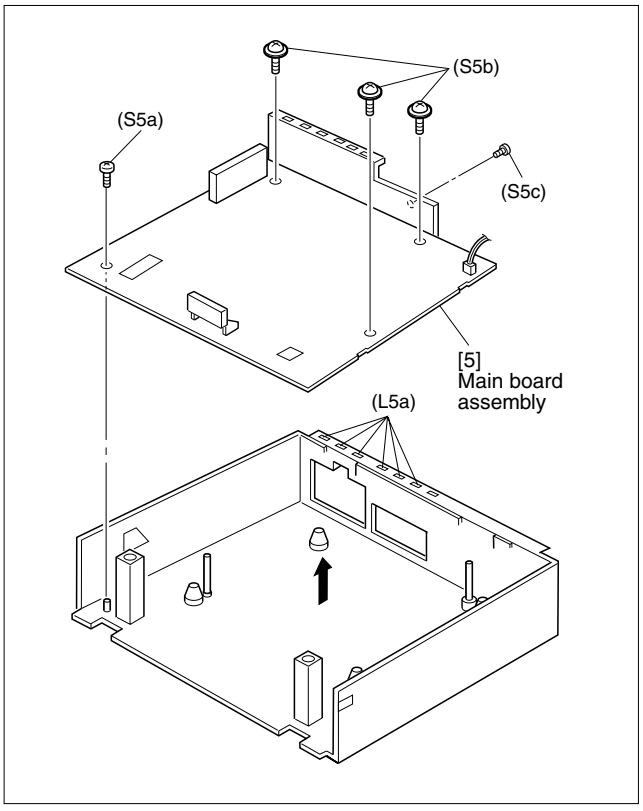


Fig. D5

1.4 Service position

This unit has been designed so that the Mechanism and Main board assemblies can be removed together from the chassis assembly. Before diagnosing or servicing the circuit boards, take out the major parts from the chassis assembly.

1.4.1 How to set the "Service position"

(1) Refer to the disassembly procedure and perform the disassembly of the major parts before removing the Drum assembly.
(2) Lower the cassette holder to prepare for the removal of the Mechanism assembly screws. (Refer to the "Procedures for lowering the Cassette holder assembly" of 1.3 Disassembly/assembly method.)
(3) Remove the combined Mechanism and Main board assemblies.
(4) Connect the wires and connectors of the major parts that have been removed in step (1). (Refer to Fig.1-4-1a.)
(5) Place the combined Mechanism and Main board assemblies upside down.
(6) Insert the power cord plug into the power outlet and then proceed with the diagnostics and servicing of the board assembly.

Notes:

- ***Before inserting the power cord plug into the power outlet, make sure that none of the electrical parts are able to short-circuit between the workbench and the board assembly.***
- ***For the disassembly procedure of the major parts and details of the precautions to be taken, see "1.3 Disassembly/assembly method".***
- ***If there are wire connections from the Main board and Mechanism assemblies to the other major parts, be sure to remove them (including wires connected to the major parts) first before performing step (2).***
- ***When carrying out diagnosis and repair of the Main board assembly in the "Service position", be sure to ground both the Main board and Mechanism assemblies. If they are improperly grounded, there may be noise on the playback picture or FDP counter display may move even when the mechanism is kept in an inoperative status.***
- ***In order to diagnose the playback or recording of the cassette tape, set the Mechanism assembly to the required mode before placing it upside down. If the mechanism mode is changed (including ejection) while it is in an upside down position the tape inside may be damaged.***

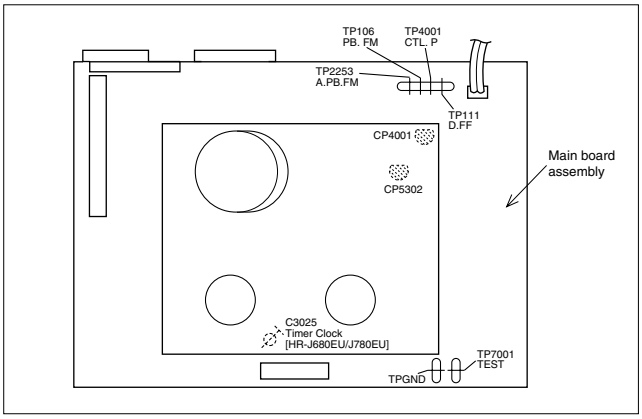


Fig. 1-4-1a

1.5 Mechanism service mode

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "Mechanism service mode".

1.5.1 How to set the "Mechanism service mode"

(1) Unplug the power cord plug from the power outlet.
(2) Connect TPGND and TP7001(TEST) on the Main board assembly with a jump wire.
(3) Insert the power cord plug into the power outlet.
(4) With lock levers (A) (B) on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers (A) (B), refer to the "Procedures for lowering the Cassette holder assembly" of 1.3 Disassembly/assembly method.)
(5) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

1.6 Jig RCU mode

This unit uses the following two modes for receiving remote control codes.

1) User RCU mode : Ordinary mode for use by the user.
2) Jig RCU mode : Mode for use in production and servicing.

When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). As both of the above two modes are stored in the EEPROM, it is required to set the VCR back to the User RCU mode each time that an adjustment is made or to check that the necessary operations have been completed. These modes can be set by the operations described below.

1.6.1 Setting the Jig RCU mode

(1) Unplug the power cord plug from the power outlet.
(2) Press and hold the "REC" and "PAUSE" buttons on the VCR simultaneously, while plugging the power cord plug into the power outlet.
When the VCR is set to the Jig RCU mode, the symbols (" : ") in the time display of the FDP are turned off.

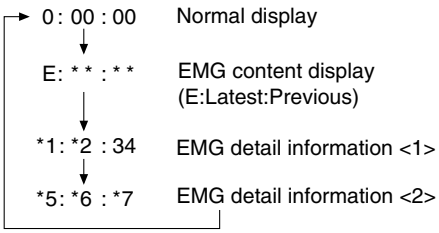
1.6.2 Setting the User RCU mode

(1) Turn off the power.
(2) Press the "REC" and "PAUSE" buttons of the VCR simultaneously. Alternatively, transmit the code "80" from the Jig RCU.

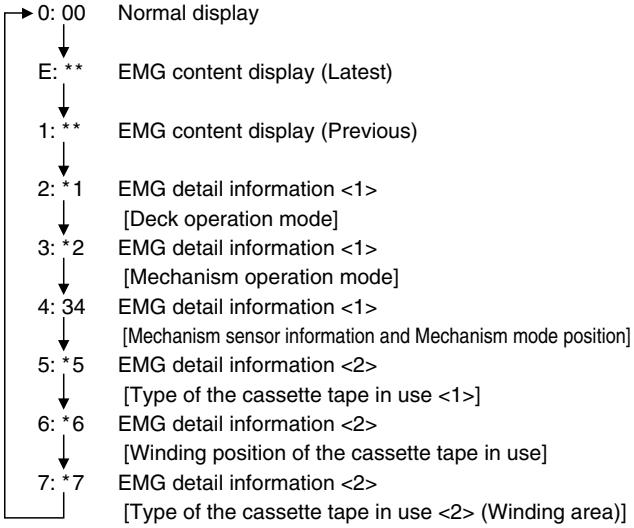
1.7 Emergency display function

This unit has a function for storing the history of the past two emergencies (EMG) and displaying them on each FDP (or OSD). With the status of the VCR and mechanism at the moment an emergency occurred can also be confirmed.

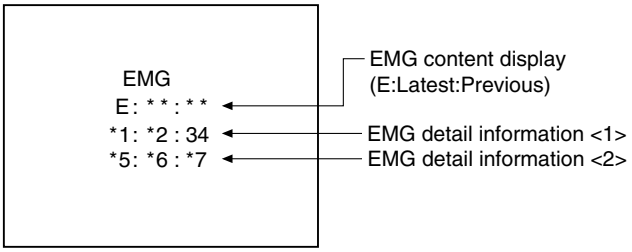
FDP display model
[FDP display]



FDP (7segment LED) display model
[FDP display]



OSD display model
[OSD display]



Notes:

- ***The EMG detail information <1><2> show the information on the latest EMG.***
  It becomes " – – : – – : – –" when there is no latest EMG record.
- ***When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received).***

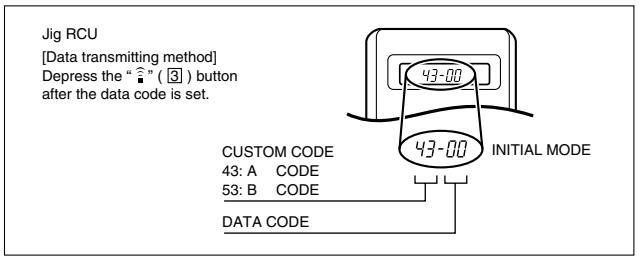
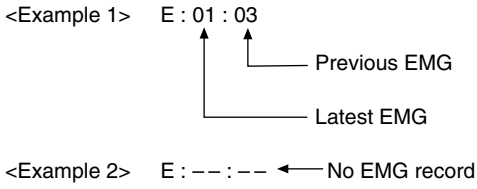


Fig. 1-7a Jig RCU [PTU94023B]

1.7.1 Displaying the EMG information

(1) Transmit the code "59" from the Jig RCU.
The FDP shows the EMG content in the form of "E: * * : * * ".



(2) Transmit the code "59" from the Jig RCU again.
The FDP shows the EMG detail information <1> in the form of " *1 : *2 : 34 ".

- *1 : Deck operation mode at the moment of EMG
- *2 : Mechanism operation mode at the moment of EMG
- 3– : Mechanism sensor information at the moment of EMG
- –4 : Mechanism mode position at the moment of EMG

(3) Transmit the code "59" from the Jig RCU once again.
The FDP shows the EMG detail information <2> in the form of " *5 : *6 : *7 ".

- *5 : Type of the cassette tape in use <1> .
- *6 : Winding position of the cassette tape in use
- *7 : Type of the cassette tape in use <2> (Winding area)

(4) Transmit the code "59" from the Jig RCU once again to reset the display.

Notes:

- ***For the OSD display model, all EMG information are showed by transmitting first code from the Jig RCU.***
- ***For the EMG content, see "1.7.3 EMG content description".***
- ***For the EMG detail information <1> , see "1.7.4 EMG detail information <1> ".***
- ***For the EMG detail information <2> , see "1.7.5 EMG detail information <2>".***

1.7.2 Clearing the EMG history

(1) Display the EMG history.
(2) Transmit the code "36" from the Jig RCU.
(3) Reset the EMG display.

1.7.3 EMG content description

Note: ***EMG contents "E08/E09" are for the model with Dynamic Drum (DD).***

FDP	CONTENT	CAUSE
E01: Loading EMG	When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the loading direction, [E:01] is identified and the power is turned off.	1. The mechanism is locked in the middle of mode transition. 2. The mechanism is locked at the loading end due to the encoder position reading error during mode transition. 3. Power is not supplied to the loading MDA.
E02: Unloading EMG	When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the unloading direction, [E:02] is identified and the power is turned off.	1. The mechanism is locked in the middle of mode transition. 2. The mechanism is locked at the unloading end due to the encoder position reading error during mode transition. 3. Power is not supplied to the loading MDA.
E03: Take Up Reel Pulse EMG	When the take-up reel pulse has not been generated for more than 4 seconds in the capstan rotating mode, [E:03] is identified, the pinch rollers are turned off and stopped, and the power is turned off. However, the reel EMG is not detected in STILL/SLOW modes.	1. The take-up reel pulse is not generated in the FWD transport modes (PLAY/FWD SEARCH/FF, etc.) because; 1) The idler gear is not meshed with the take-up reel gear; 2) The idler gear is meshed with the take-up reel gear, but incapable of winding due to too large mechanical load (abnormal tension); 3) The take-up reel sensor does not output the FG pulse. 2. The supply reel pulse is not generated in the REV transport modes (REV SEARCH/REW, etc.) because; 1) The idler gear is not meshed with the supply reel gear. 2) The idler gear is meshed with the supply reel gear, but incapable of winding due to too large a mechanical load (abnormal tension); 3) The supply reel sensor does not output the FG pulse. 3. Power is not supplied to the reel sensors.
E04: Drum FG EMG	When the drum FG pulse has not been input for more than 3 seconds in the drum rotating mode, [E:04] is identified, the pinch rollers are turned off and stopped, and the power is turned off.	1. The drum could not start or the drum rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high; 2) The tape is damaged or a foreign object (grease, etc.) adheres to the tape. 2. The drum FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (hall device) of the drum is faulty. 3. The drum control voltage (DRUM CTL V) is not supplied to the MDA. 4. Power is not supplied to the drum MDA.
E05: Cassette Eject EMG	When the eject operation does not complete in 3 seconds after the start, [E:05] is identified, the pinch rollers are turned off and stopped, and the power is turned off. When the cassette insertion operation does not complete in 3 seconds after the start, the cassette is ejected. In addition, when the operation does not complete within 3 seconds after the start, [E:05] is also identified and the power is turned off immediately.	1. The cassette cannot be ejected due to a failure in the drive mechanism of the housing. 2. When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque. Housing load increasing factors: Temperature environment (low temperature, etc.), mechanism wear or failure. 3. The sensor/switch for detecting the end of ejection are not functioning normally. 4. The loading motor drive voltage is lower than specified or power is not supplied to the motor (MDA). 5. When the user attempted to eject a cassette, a foreign object (or perhaps the user's hand) was caught in the opening of the housing.
E06: Capstan FG EMG	When the capstan FG pulse has not been generated for more than 1 second in the capstan rotating mode, [E:06] is identified, the pinch rollers are turned off and stopped, and the power is turned off.However, the capstan EMG is not detected in STILL/SLOW/FF/REW modes.	1. The capstan could not start or the capstan rotation has stopped due to too large a load on the tape, because; 1) The tape tension is abnormally high (mechanical lock); 2) The tape is damaged or a foreign object (grease, etc.) is adhered to the tape (occurrence of tape entangling, etc.). 2. The capstan FG pulse did not reach the System controller CPU because; 1) The signal circuit is disconnected in the middle; 2) The FG pulse generator (MR device) of the capstans is faulty. 3. The capstan control voltage (CAPSTAN CTL V) is not supplied to the MDA. 4. Power is not supplied to the capstan MDA.
E07: SW Power Short-Circuit EMG	When short-circuiting of the SW power supply with GND has lasted for 0.5 second or more, [E:07] is identified, all the motors are stopped and the power is turned off.	1. The SW 5 V power supply circuit is shorted with GND. 2. The SW 12 V power supply circuit is shorted with GND.
E08: DD Initialized (Absolute Position Sensor) EMG	When DD tilting does not complete in 4 seconds, [E:08] is identified, the tilt motor is stopped and the power is turned off.	1. The absolute value sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the absolute sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the absolute value sensor. 4. The absolute value sensor data is not sent to the System Controller CPU.
E09: DD FG EMG	When the DD FG pulse is not generated within 2.5 seconds, [E:09] is identified, the tilt motor is stopped and the power is turned off.	1. The FG sensor is defective. (The soldered parts have separated.) 2. The pull-up resistor at the FG sensor output is defective. (The soldered parts have separated.) 3. Contact failure or soldering failure of the pins of the connector (board-to-board) to the FG sensor. 4. The power to the sensor is not supplied. (Connection failure/soldering failure) 5. The FG pulse is not sent to the System Controller CPU. 6. The tilt motor is defective. (The soldered parts have separated.) 7. The drive power to the tilt motor is not supplied. (Connection failure/soldering failure) 8. The tilt motor drive MDA - IC is defective. 9. Auto-recovery of the DD tilting cannot take place due to overrun.
E0A: Supply Reel Pulse EMG	When the supply reel pulse has not been generated for more than 10 seconds in the capstan rotating mode, [E:0A] is identified and the cassette is ejected (but the power is not turned off). However, note that the reel EMG is not detected in the SLOW/STILL mode.	1. The supply reel pulse is not generated in the FWD transport mode (PLAY/FWD SEARCH/FF, etc.) because; 1) PLAY/FWD or SEARCH/FF is started while the tape in the inserted cassette is cut in the middle; 2) A mechanical factor caused tape slack inside and outside the supply reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the FWD transport, so the pulse is not generated until then; 3) The FG pulse output from the supply reel sensor is absent. 2. The take-up reel pulse is not generated in the REV transport mode (REV SEARCH/REW, etc.). 1) REV SEARCH/REW is started when the tape in the inserted cassette has been cut in the middle; 2) A mechanical factor caused tape slack inside and outside the take-up reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the REV transport, so the pulse will not be generated until that time; 3) The FG pulse output from the take-up reel sensor is absent. 3. The power to a reel sensor is not supplied.
EC1 or EU1: Head clog warning	Presupposing the presence of the control pulse output in the PLAY mode, when the value obtained by mixing the two V.FM output channels (without regard to the A.FM output) has remained below a certain threshold level for more than 10 seconds, [E:C1] or [E:U1] is identified and recorded in the emergency history. During the period in which a head clog is detected, the FDP and OSD repeat the "3-second warning display" and "7-second noise picture display" alternately. EMG code : "E:C1" or "E:U1" / FDP : "U:01" / OSD : "Try cleaning tape." or "Use cleaning cassette." The head clog warning is reset when the above-mentioned threshold has been exceeded for more than 2 seconds or the mode is changed to another mode than PLAY.	

Table 1-7-3a

1.7.4 EMG detail information <1>

The status (electrical operation mode) of the VCR and the status (mechanism operation mode/sensor information) of the mechanism in the latest EMG can be confirmed based on the figure in EMG detail information <1> .

[FDP/OSD display]

*1 : *2 : 34

*1 : Deck operation mode at the moment of EMG
*2 : Mechanism operation mode at the moment of EMG
3– : Mechanism sensor information at the moment of EMG
–4 : Mechanism mode position at the moment of EMG

Note:

- ***For EMG detailed information <1>, the content of the code that is shown on the FDP (or OSD) differs depending on the parts number of the system control microprocessor (IC3001) of the VCR. The system control microprocessor parts number starts with two letters, refer these to the corresponding table.***

***1 : Deck operation mode**
[Common table of MN*, HD* and M3*]

Display		Deck operation mode
MN*/M3*	HD*	
00	-	Mechanism being initialized
01	00	STOP with pinch roller pressure off (or tape present with P.OFF)
02	01	STOP with pinch roller pressure on
03	-	POWER OFF as a result of EMG
04	04	PLAY
0C	0E	REC
10	11	Cassette ejected
20	22	FF
21	-	Tape fully loaded, START sensor ON, short FF
22	-	Cassette identification FWD SEARCH before transition to FF (SP x7-speed)
24	26	FWD SEARCH (variable speed) including x2-speed
2C	2E	INSERT REC
40	43	REW
42	-	Cassette identification REV SEARCH before transition to REW (SP x7-speed)
44	47	REV SEARCH (variable speed)
4C	4C	AUDIO DUB
6C	6E	INSERT REC (VIDEO + AUDIO)
84	84	FWD STILL / SLOW
85	85	REV STILL / SLOW
8C	8F	REC PAUSE
8D	-	Back spacing
8E	-	Forward spacing (FWD transport mode with BEST function)
AC	AF	INSERT REC PAUSE
AD	-	INSERT REC back spacing
CC	CD	AUDIO DUB PAUSE
CD	-	AUDIO DUB back spacing
EC	EF	INSERT REC (VIDEO + AUDIO) PAUSE
ED	-	INSERT REC (VIDEO + AUDIO) back spacing

***2 : Mechanism operation mode**
[Common table of MN* and M3*]

Display		Mechanism operation mode
MN*	M3*	
00	00	Command standby (Status without executing command)
02	02	POWER OFF by EMG occurrence
04	04	Moving to the adjacent position in the LOAD direction
06	06	Moving to the adjacent position in the UNLOAD direction
08	08	Cassette ejection being executed / Cassette housing ejection being executed
-	0A	Mode transition to STOP with cassette ejection end
0A	0C	Cassette insertion being executed
0C	0E	Tape being loaded
0E	10	Tape being unloaded
10	12	Mode transition to STOP with pinch roller compression ON
12	14	Mode transition to STOP with pinch roller compression OFF
14	16	Mode transition to STOP with pinch roller compression OFF as a result of POWER OFF
16	18	Mode transition to STOP with pinch roller compression ON as a result of POWER ON
18	1A	Mode transition to PLAY
1A	1C	Mode transition to FWD SEARCH
1C	1E	Mode transition to REC
1E	20	Mode transition to FWD STILL / SLOW
20	22	Mode transition to REV STILL / SLOW
22	24	Mode transition to REV SEARCH
24	26	Mode transition from FF / REW to STOP
26	28	Mode transition to FF
28	2A	Mode transition to REW
2A	2C	4 sec. of REV as a result of END sensor going ON during loading
2C	2E	Short FF / REV as a result of END sensor going ON during unloading
2E	30	Mechanism position being corrected due to overrun
80	80	Mechanism in initial position (Dummy command)

[Table of HD*]

Display	Mechanism operation mode
00	STOP with pinch roller pressure off
01	STOP with pinch roller pressure on
02	U/L STOP (or tape being loaded)
04	PLAY
05	PLAY (x1-speed playback using JOG)
0E	REC
11	Cassette ejected
22	FF
26	FWD SEARCH (variable speed) including x2-speed
2E	INSERT REC
43	REW
47	REV SEARCH
4C	AUDIO DUB
6E	INSERT REC (VIDEO + AUDIO)
84	FWD STILL/SLOW
85	REV STILL/SLOW
8F	REC PAUSE
AF	INSERT REC PAUSE
C7	REV SEARCH (x1-speed reverse playback using JOG)
CD	AUDIO DUB PAUSE
EF	INSERT REC (VIDEO + AUDIO) PAUSE
F0	Mechanism being initialized
F1	POWER OFF as a result of EMG
F2	Cassette being inserted
F3	Cassette being ejected
F4	Transition from STOP with pinch roller pressure on to STOP with pinch roller pressure off
F5	Transition from STOP with pinch roller pressure on to PLAY
F6	Transition from STOP with pinch roller pressure on to REC
F7	Cassette type detection SEARCH before FF/REW is being executed
F8	Tape being unloaded
F9	Transition from STOP with pinch roller pressure off to STOP with pinch roller pressure on
FA	Transition from STOP with pinch roller pressure off to FF/REW
FB	Transition from STOP with pinch roller pressure off to REC.P (T.REC,etc.)
FC	Transition from STOP with pinch roller pressure off to cassette type detection SEARCH
FD	Short REV being executed after END sensor on during unloading
FE	Tension loosening being executed after tape loading (STOP with pinch roller pressure on)

3– : Mechanism sensor information
[Common table of MN*, HD* and M3*]

Display	Mechanism sensor information				
	MN* / HD* S-VHS SW	M3* CASS SW	REC safety SW	Start sensor	End sensor
0-	VHS	Cassette insertion	Tab broken	ON	ON
1-	VHS	Cassette insertion	Tab broken	ON	OFF
2-	VHS	Cassette insertion	Tab broken	OFF	ON
3-	VHS	Cassette insertion	Tab broken	OFF	OFF
4-	VHS	Cassette insertion	Tab present	ON	ON
5-	VHS	Cassette insertion	Tab present	ON	OFF
6-	VHS	Cassette insertion	Tab present	OFF	ON
7-	VHS	Cassette insertion	Tab present	OFF	OFF
8-	S-VHS	Cassette ejection	Tab broken	ON	ON
9-	S-VHS	Cassette ejection	Tab broken	ON	OFF
A-	S-VHS	Cassette ejection	Tab broken	OFF	ON
B-	S-VHS	Cassette ejection	Tab broken	OFF	OFF
C-	S-VHS	Cassette ejection	Tab present	ON	ON
D-	S-VHS	Cassette ejection	Tab present	ON	OFF
E-	S-VHS	Cassette ejection	Tab present	OFF	ON
F-	S-VHS	Cassette ejection	Tab present	OFF	OFF

–4 : Mechanism mode position
[Common table of MN*, HD* and M3*]

Display			Mechanism mode position
MN*	HD*	M3*	
-0	-7	-	Initial value
-1	-0	-	EJECT position
-	-	-0	EJECT position (Cassette housing drive mode)
-2	-7	-	Housing operating
-	-	-1	Between EJECT and U / L STOP
-3	-1	-2	U / L STOP position
-	-	-3	Guide arm drive position
-4	-7	-4	Tape being loaded / unloaded (When the pole base is located on the front side of the position just beside the drum)
-5	-2	-5	Tape being loaded / unloaded (When the pole base is located on the rear side of the position just beside the drum)
-6	-7	-6	Pole base compressed position
-7	-3	-F	FF / REW position
-8	-7	-F	Between FF / REW and STOP with pinch roller compression ON
-9	-4	-F	STOP with pinch roller compression OFF
-A	-7	-E	Between STOP with pinch roller compression OFF and REV
-B	-5	-	REV (REV STILL / SLOW) position
-	-	-D	REV position
-	-	-C	Between REV and REV STILL / SLOW
-	-	-B	REV STILL / SLOW position
-C	-7	-	Between REV and FWD
-	-	-A	Between REV STILL / SLOW and FWD STILL / SLOW
-D	-6	-	FWD (FWD STILL / SLOW) position
-	-	-9	FWD STILL / SLOW position
-E	-7	-	Between FWD and PLAY
-	-	-8	Between FWD STILL / SLOW and PLAY
-F	-6	-7	PLAY position

Note:
- ***In the case of the "HD*" microprocessor, as the display is always "-7" at any intermediate position between modes, the position of transitory EMG may sometimes not be located.***

1.7.5 EMG detail information <2>

The type of the cassette tape and the cassette tape winding position can be confirmed based on the figure in EMG detail information <2> .

[FDP/OSD display]

*5 : *6 : *7

*5 : Type of the cassette tape in use <1>
*6 : Winding position of the cassette tape in use
*7 : Type of the cassette tape in use <2> (Winding area)

Note:
- ***EMG detail information <2> is the reference information stored using the remaining tape detection function of the cassette tape. As a result, it may not identify cassette correctly when a special cassette tape is used or when the tape has variable thickness.***

***5 : Cassette tape type <1>**

Display	Cassette tape type <1>
00	Cassette type not identified
16	Large reel/small reel (T-0 to T-15/T-130 to T-210) not classified
82	Small reel, thick tape (T-120) identified/thin tape (T-140) identified
84	Large reel (T-0 to T-60) identified
92	Small reel, thick tape (T-130) identified/thin tape (T-160 to T-210) identified
93	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) not classified
C3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
D3	Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified
E1	C cassette, thick tape (TC-10 to TC-20) identified
E2	Small reel, thick tape (T-0 to T-100) identified
E9	C cassette, thin tape (TC-30 to TC-40) identified
F1	C cassette, thick tape/thin tape (TC-10 to TC-40) not classified

Notes:
- ***Cassette tape type <1> is identified a few times during mode transition and the identification count is variable depending on the cassette tape type. If an EMG occurs in the middle of identification, the cassette tape type may not be able to be identified.***
- ***If other value than those listed in the above table is displayed, the cassette tape type is not identified.***

***6 : Cassette tape winding position**

The cassette tape winding position at the moment of EMG is displayed by dividing the entire tape (from the beginning to the end) in 22 sections using a hex number from “00” to “15”.

“00” : End of winding
“15” : Beginning of winding
“FF or ––” : Tape position not identified

***7 : Cassette tape type <2> (Winding area)**

Display	Cassette tape type <2>	
00	Cassette type not identified	
07	Small reel, thick tape	T-5
08 - 0E	C cassette, thick tape	TC-10
09 - 15	C cassette, thick tape	TC-20P
0A - 0B	Small reel, thick tape	T-20
0A - 16	C cassette, thin tape	TC-30
0A - 16	C cassette, thin tape	TC-40
0D - 0F	Small reel, thick tape	T-40
11 - 14	Small reel, thick tape	T-60
15 - 18	Small reel, thick tape	T-80 / DF-160
17 - 1A	Small reel, thick tape	T-90 / DF-180
19 - 1D	Small reel, thick tape	T-100
1D - 21	Small reel, thick tape	T-120 / DF-240
1E - 1F	Small reel, thin tape	T-140
1F - 23	Small reel, thick tape	T-130
21 - 23	Small reel, thin tape	T-160
21 - 23	Small reel, thin tape	T-168
22 - 24	Small reel, thick tape	DF-300
22 - 24	Small reel, thin tape	T-180 / DF-360
22 - 24	Small reel, thin tape	T-210 / DF-420
22 - 23	Large reel	T-5
23 - 24	Large reel	T-10
25 - 26	Large reel	T-20
27 - 29	Large reel	T-30
29 - 2B	Large reel	T-40
2D - 2F	Large reel	T-60

Note:
- ***The values of cassette tape type <2> in the above table are typical values with representative cassette tapes.***

SECTION 2
MECHANISM ADJUSTMENT

2.1 Before starting repair and adjustment

2.1.1 Precautions

(1) Unplug the power cord plug of the VCR before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to damage the lugs, etc. during the repair work.
(5) When reattaching the front panel assembly, make sure that the door opener of the cassette holder assembly is lowered in position prior to the reinstallation. (See SECTION 1 DISASSEMBLY.)
(6) When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). (See SECTION 1 DISASSEMBLY.)

2.1.2 Checking for proper mechanical operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See SECTION 1 DISASSEMBLY.)

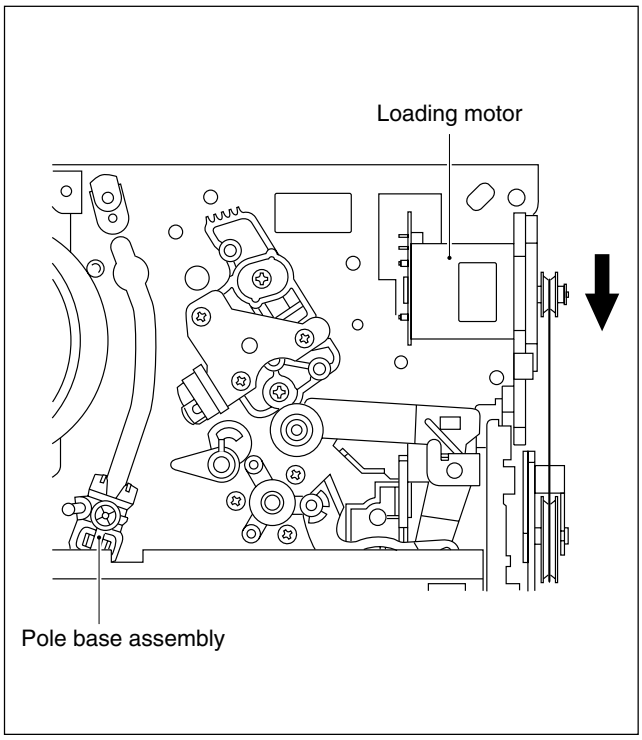


Fig. 2-1-3a

2.1.3 Manually removing the cassette tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cord plug from the power outlet.
(2) Refer to the disassembly procedure and perform the disassembly of the major parts before removing the drum assembly.
(3) Unload the pole base assembly by manually turning the loading motor of the mechanism assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-3a.)
(4) Bring the pole base assembly to a pause when it reaches the position where it is hidden behind the cassette tape.
(5) Move the top guide toward the drum while holding down the lug (A) of the bracket retaining the top guide. Likewise hold part (B) down and remove the top guide.
Section (C) of the top guide is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (See Fig.2-1-3b.)
(6) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(7) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

Note:

- ***For the disassembly procedure of the major parts and details of the precautions to be taken, see "SECTION 1 DISASSEMBLY".***

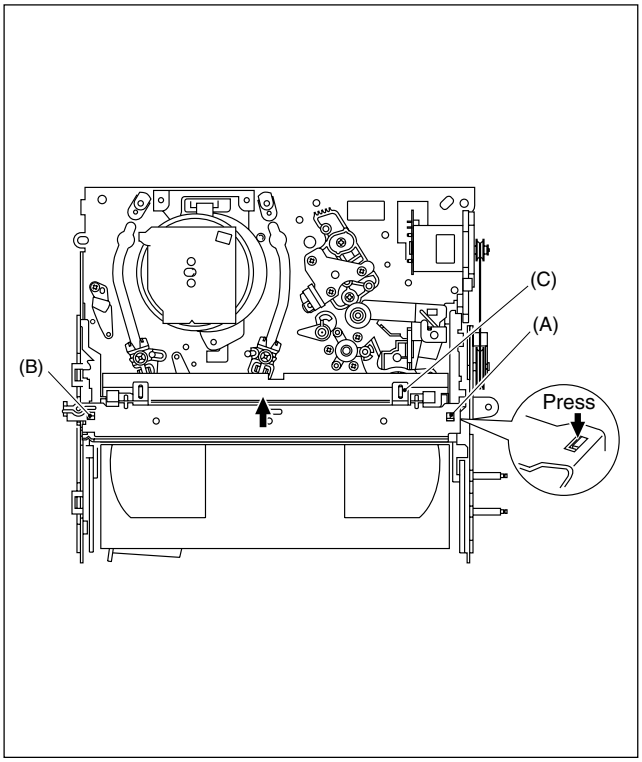


Fig. 2-1-3b

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, front panel assembly and others so that the mechanism assembly is visible. (See SECTION 1 DASASSEMBLY.)
(2) While keeping the tension arm assembly of the mechanism assembly free from tension, pull the tape on the pole base assembly (supply or take-up side) out of the guide roller. (See Fig.2-1-3c.)
(3) Take the spring of the pinch roller arm assembly off the hook of the press lever assembly, and detach it from the tape. (See Fig.2-1-3d.)
(4) In the same way as in the electrical failure instructions in 2.1.3-1(5), remove the top guide.
(5) Raise the cassette tape cover. By keeping it in that position, draw out the cassette tape case from the cassette holder and take out the tape.
(6) By hanging the pinch roller arm assembly spring back on the hook, take up the slack of the tape into the cassette.

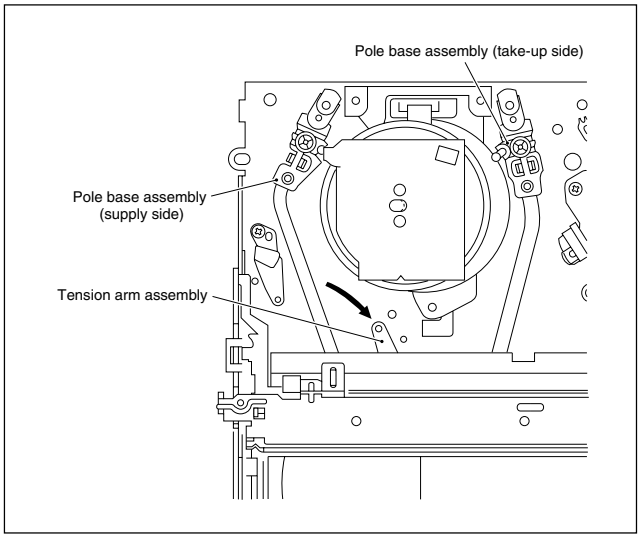


Fig. 2-1-3c

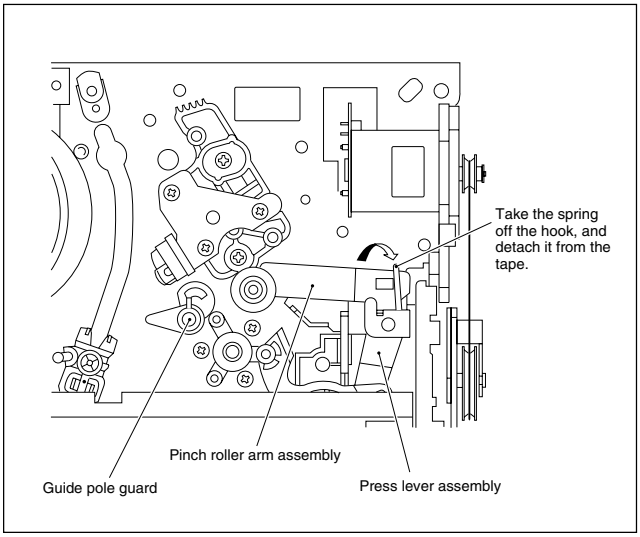
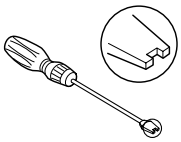
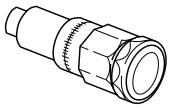
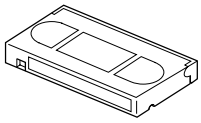
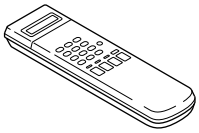
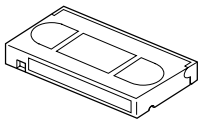
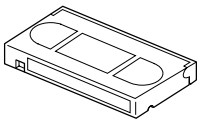


Fig. 2-1-3d

2.1.4 Jigs and tools required for adjustment

Roller driver PTU94002	A/C head positioning tool PTU94010	Torque gauge PUJ48075-2
		
Back tension cassette gauge PUJ48076-2	Jig RCU PTU94023B	
		
Alignment tape (SP, stairstep, PAL) MHPE	Alignment tape (LP, stairstep, PAL) MHPE-L	
		

2.1.5 Maintenance and inspection

1. Location of major mechanical parts

In this chapter, the two mechanism speeds are described by comparing the speeds of the standard type and the high-speed FF/REW type.
It is possible to distinguish between these two types of mechanism by the diameters of their capstan pulleys.
The capstan pulley diameter for the standard type is approx. 32 mm.
The capstan pulley diameter for the high-speed FF/REW type is approx. 43 mm.
For information on the different parts used in the two mechanism types, please refer to the “Replacement of major parts”.

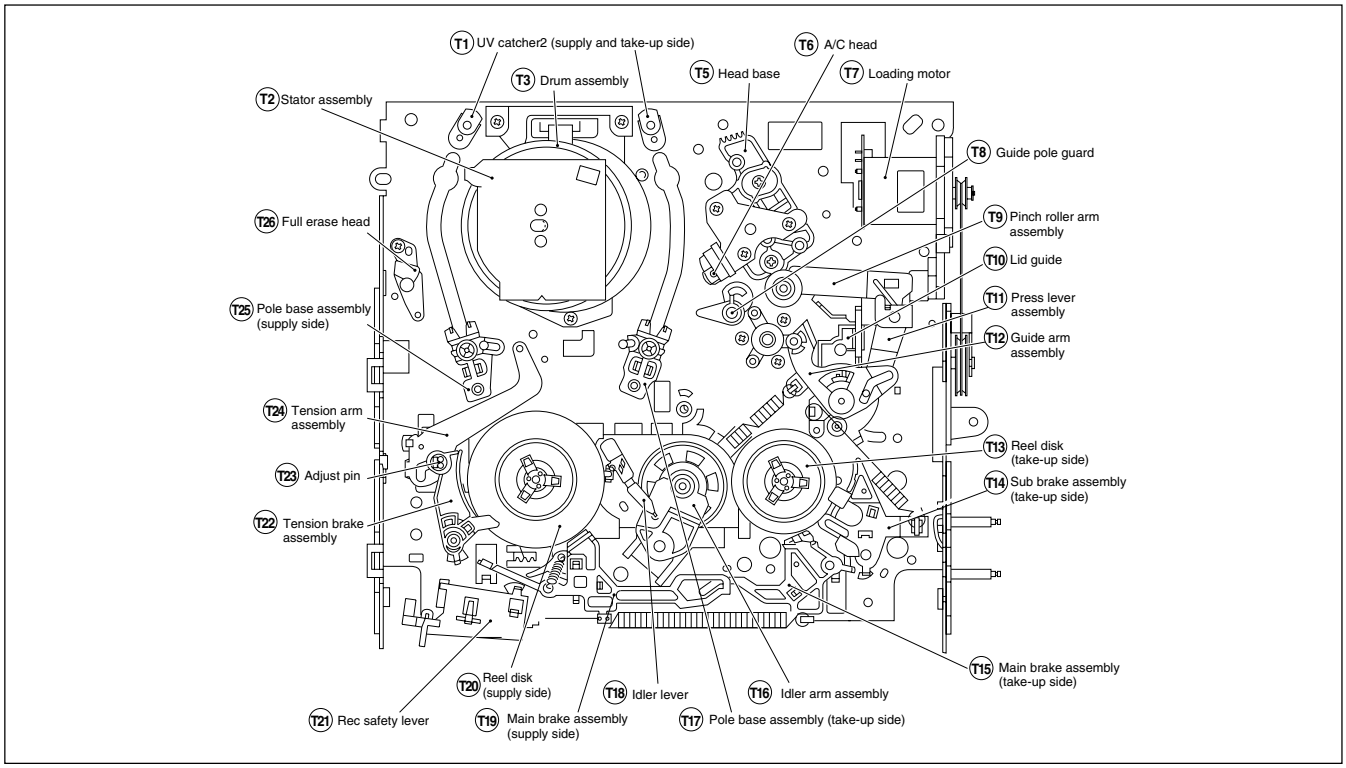

T1 UV catcher2 (supply and take-up side)
T2 Stator assembly
T3 Drum assembly
T5 Head base
T6 A/C head
T7 Loading motor
T8 Guide pole guard
T9 Pinch roller arm assembly
T10 Lid guide
T11 Press lever assembly
T12 Guide arm assembly
T13 Reel disk (take-up side)
T14 Sub brake assembly (take-up side)
T15 Main brake assembly (take-up side)
T16 Idler arm assembly
T17 Pole base assembly (take-up side)
T18 Idler lever
T19 Main brake assembly (supply side)
T20 Reel disk (supply side)
T21 Rec safety lever
T22 Tension brake assembly
T23 Adjust pin
T24 Tension arm assembly
T25 Pole base assembly (supply side)
T26 Full erase head

Fig. 2-1-5a Mechanism assembly top side

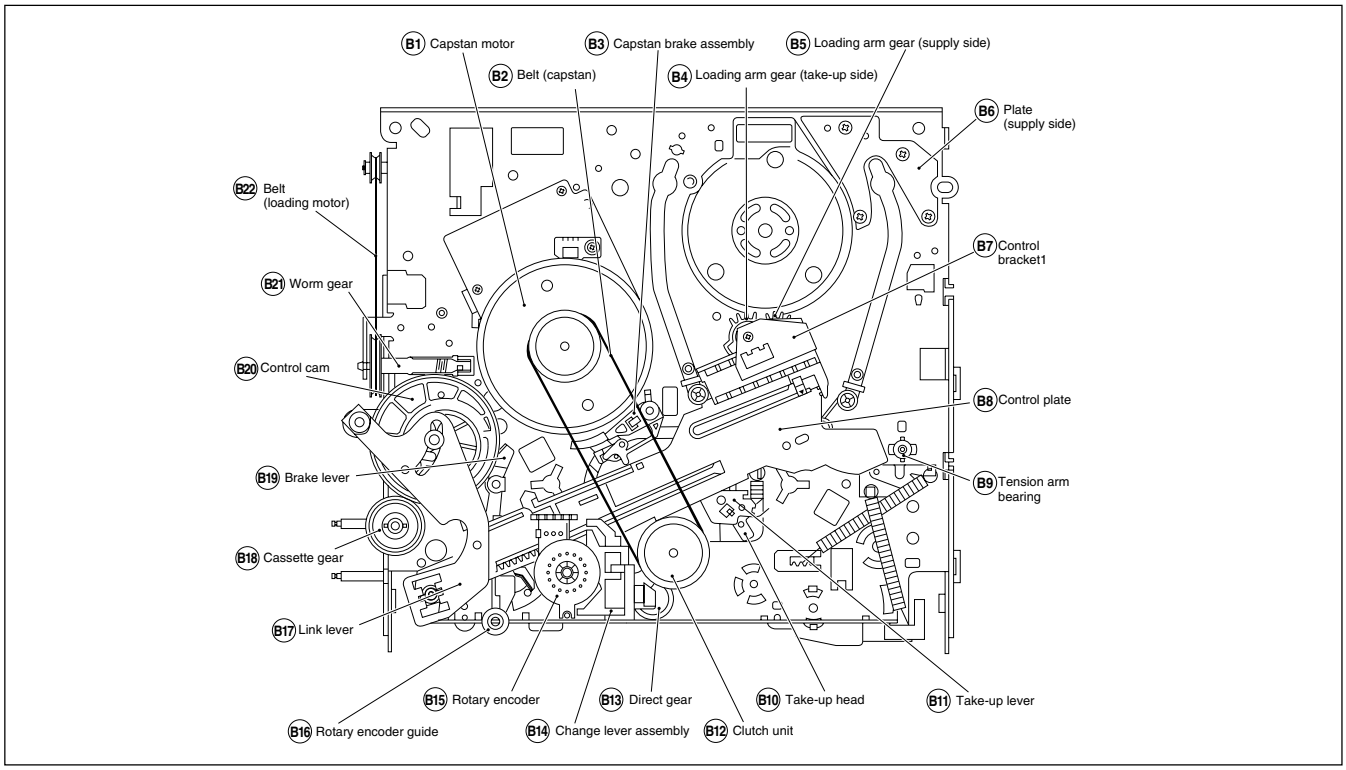


Fig. 2-1-5b Mechanism assembly bottom side

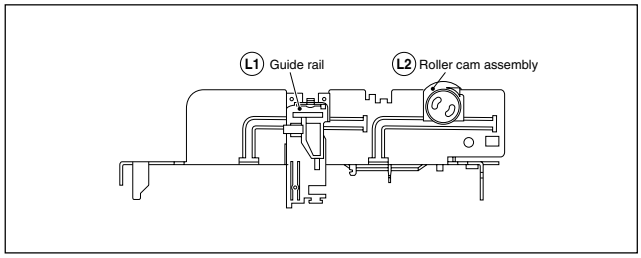


Fig. 2-1-5c Mechanism assembly left side

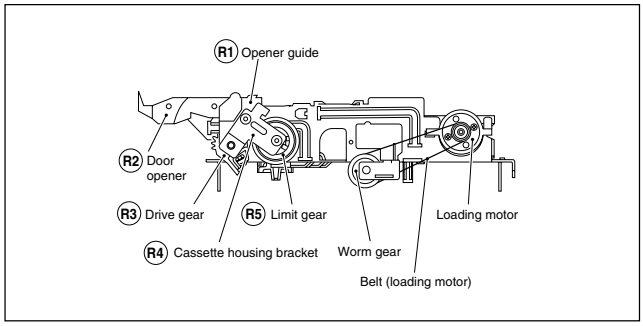


Fig. 2-1-5d Mechanism assembly right side

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note:

- ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

Note:

- ***See the "mechanism assembly" diagram of the parts list for the lubricating or greasing spots, and for the types of oil or grease to be used.***

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake assembly		○
	Main brake assembly		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear		○
	Control plate		○
Other	Brush	★○	★○
	Tension brake assembly	○	○
	Rotary encoder		○

★ : Cleaning

○ : Inspection or replacement if necessary

Table 2-1-5a

5. Disassembling procedure table

The following table indicates the order in which parts are removed for replacement. To replace parts, remove them in the order of 1 to 18 as shown in the table. To install them, reverse the removal sequence.

The symbols and numbers preceding the individual part names represent the numbers in the "Location of major mechanical parts" table. Also, the "T", "B", and "T/B" on the right of each part name shows that the particular part is removed from the front, from the back, and from both sides of the mechanism, respectively.

Symbols and numbers	Removal parts / (Reference items) Replacement parts	Front (T)/Back (B) of mechanism	Number of removal steps	L1 Guide rail	L2 Roller cam assembly	R4 Cassette housing bracket	R1 Opener guide	— Relay gear	— Cassette holder assembly	R3 Drive gear	— Drive arm	T9 Pinch roller arm assembly	T12 Guide arm assembly	T11 Press lever assembly	T1 UV catcher2	B15 Rotary encoder	B12 Clutch unit	B14 Change lever assembly	B13 Direct gear	— Coupling gear	B17 Link lever	B21 Worm gear	B7 Control bracket1	B8 Control plate	B5 Loading arm gear (supply side)	B4 Loading arm gear (take-up side)	B11 Take-up lever	T14 Sub brake assembly (take-up side)	T15 Main brake assembly (take-up side)	T13 Reel disk (take-up side)	T22 Tension brake assembly	T24 Tension arm assembly	T18 Idler lever	B19 Brake lever (*1)
L1	2.2.3 Guide rail	T	1																															
L2	2.2.3 Roller cam assembly	T	1																															
R4	2.2.3 Cassette housing bracket	T	1																															
R1	2.2.3 Opener guide	T	2			1																												
R2	2.2.3 Door opener	T	3			1	2																											
—	2.2.3 Relay gear	T	3			1	2																											
R5	2.2.3 Limit gear	T	3			1	2																											
—	2.2.3 Cassette holder assembly	T	6	1	2	3	4	5																										
R3	2.2.3 Drive gear	T	4			1	2	3																										
—	2.2.3 Drive arm	T	8	1	2	3	4	5	6	7																								
T9	2.2.4 Pinch roller arm assembly	T	1																															
T12	2.2.5 Guide arm assembly	T	1																															
T11	2.2.5 Press lever assembly	T	3									1	2																					
T6	2.2.6 A/C head	T	1																															
T7	2.2.7 Loading motor	T	1																															
B1	2.2.8 Capstan motor	T/B	1																															
T1	2.2.9 UV catcher2	T	1																															
T17	2.2.9 Pole base assembly (take-up side)	T/B	2												1																			
T25	2.2.9 Pole base assembly (supply side)	T/B	2												1																			
B15	2.2.10 Rotary encoder	B	1																															
B12	2.2.11 Clutch unit	B	1																															
B14	2.2.12 Change lever assembly	B	3													1	2																	
B13	2.2.12 Direct gear	B	4													1	2	3																
—	2.2.12 Coupling gear	B	5													1	2	3	4															
—	2.2.12 Clutch gear	B	6													1	2	3	4	5														
B17	2.2.13 Link lever	B	1																															
B18	2.2.14 Cassette gear	B	2																		1													
B20	2.2.14 Control cam	B	2																		1													
B21	2.2.14 Worm gear	B	1																															
T10	- Lid guide	T/B	5									1	2	3								4												
B7	2.2.15 Control bracket1	B	1																															
B8	2.2.15 Control plate	B	6													1	2	3			4		5											
B5	2.2.16 Loading arm gear (supply side)	B	7													1	2	3			4		5	6										
B4	2.2.16 Loading arm gear (take-up side)	B	8													1	2	3			4		5	6	7									
—	2.2.16 Loading arm gear shaft	B	9													1	2	3			4		5	6	7	8								
B11	2.2.17 Take-up lever	T/B	7													1	2	3			4		5	6										
B10	2.2.17 Take-up head	T/B	8													1	2	3			4		5	6			7							
—	2.2.17 Control plate guide	T/B	8													1	2	3			4		5	6			7							
B3	2.2.18 Capstan brake assembly	T/B	7													1	2	3			4		5	6										
T14	2.2.19 Sub brake assembly(take-up side)	T/B	15	1	2	3	4	5	6	7	8					9	10	11			12		13	14										
T15	2.2.20 Main brake assembly(take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11			12		13	14				15						
T19	2.2.20 Main brake assembly(supply side)	T/B	9	1	2	3	4	5	6	7	8																							
T13	2.2.20 Reel disk (take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11			12		13	14				15						
T22	2.2.21 Tension brake assembly	T/B	9	1	2	3	4	5	6	7	8																							
T20	2.2.21 Reel disk (supply side)	T/B	10	1	2	3	4	5	6	7	8																					9		
T24	2.2.21 Tension arm assembly	T/B	10	1	2	3	4	5	6	7	8																					9		
B9	2.2.21 Tension arm bearing	T/B	10	1	2	3	4	5	6	7	8																					9		
T18	2.2.22 Idler lever	T/B	17	1	2	3	4	5	6	7	8					9	10	11			12		13	14								15	16	
T16	2.2.22 Idler arm assembly	T/B	18	1	2	3	4	5	6	7	8					9	10	11			12		13	14								15	16	17
B19	- Brake lever (*1)	T/B	18	1	2	3	4	5	6	7	8					9	10	11			12		13	14				15	16	17				
B16	- Rotary encoder guide	T/B	19	1	2	3	4	5	6	7	8					9	10	11			12		13	14				15	16	17				18

Table 2-1-5b

Note:

- ***The parts with marked (∗) have different types of mechanisms (standard type or high-speed FF/REW type).***
  - ***∗1 : Uses the standard type mechanism only.***
  - ***∗2 : Uses the high-speed FF/REW type mechanism only.***

2.2 Replacement of major parts

2.2.1 Before starting disassembling (Phase matching between mechanical parts)

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.
Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm gear, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.
Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as the drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another. (For information on phase matching of the mechanism, see the instructions on how to install individual parts.)
This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to set the "Mechanism assembling mode"

Remove the mechanism assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY.) Turn the worm gear toward the front so that the guide hole of the control cam is brought into alignment with the hole at the mechanism assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-2a.)

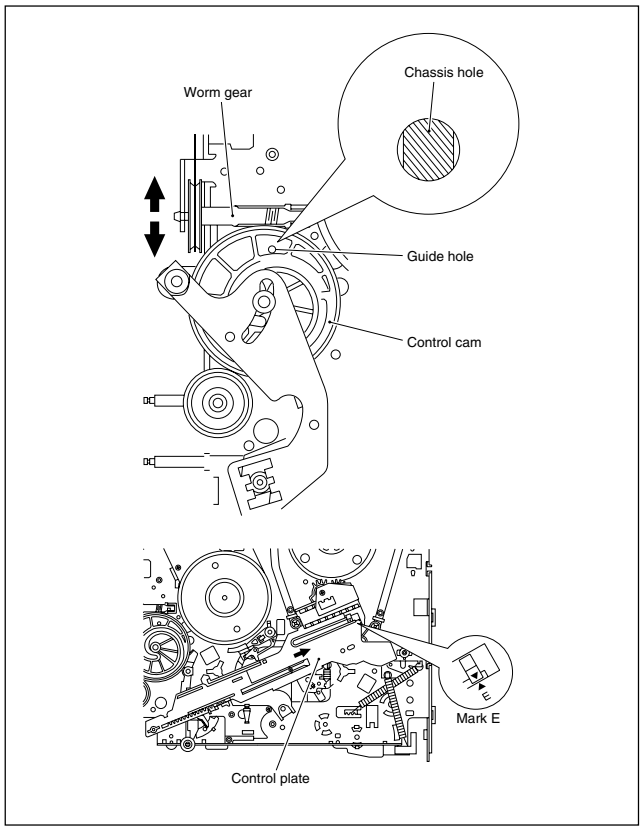


Fig. 2-2-2a

2.2.3 Cassette holder assembly

1. How to remove

(1) Remove the guide rail and roller cam assembly. (See Fig.2-2-3a.)
(3 lugs on the guide rail and one lug on the roller cam assembly)

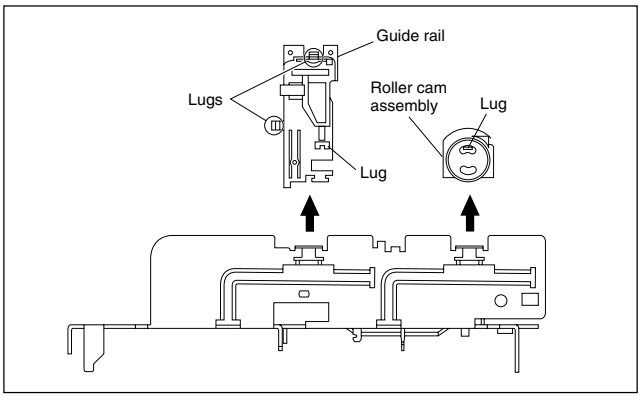


Fig. 2-2-3a

(2) Remove the two slit washers and remove the cassette housing bracket. (See Fig.2-2-3b.)
(3) Remove the opener guide, spring(A), door opener, relay gear and limit gear. (See Fig.2-2-3b.)

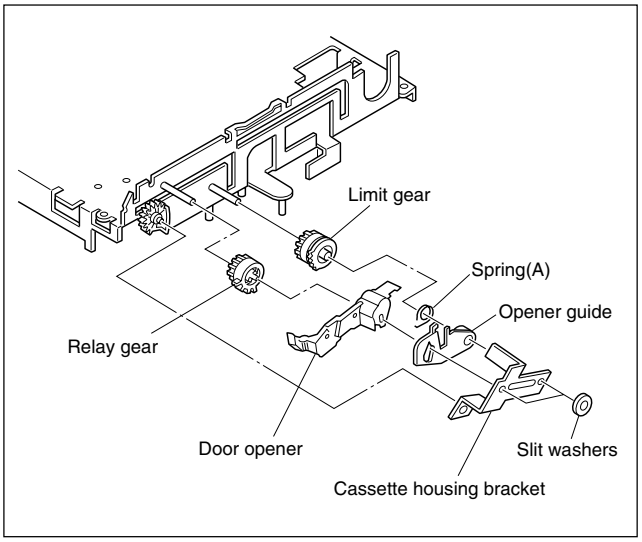


Fig. 2-2-3b

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the roller cam assembly have been removed (so that the drive arm is upright). (See Fig.2-2-3c.)

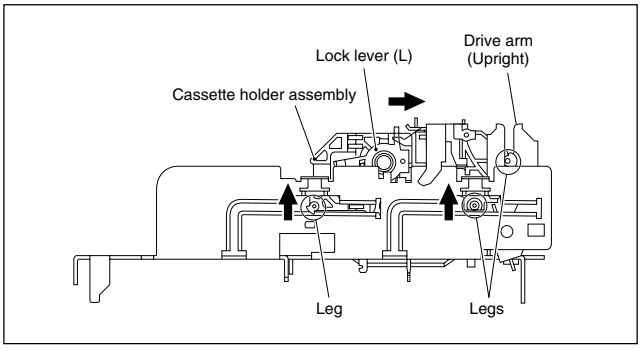


Fig. 2-2-3c

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs (A) and (B) on the right side out of the rail and also pull up the leg(C). (See Fig.2-2-3d and Fig.2-2-3e.)
(6) Draw out the drive gear, and remove the drive arm.

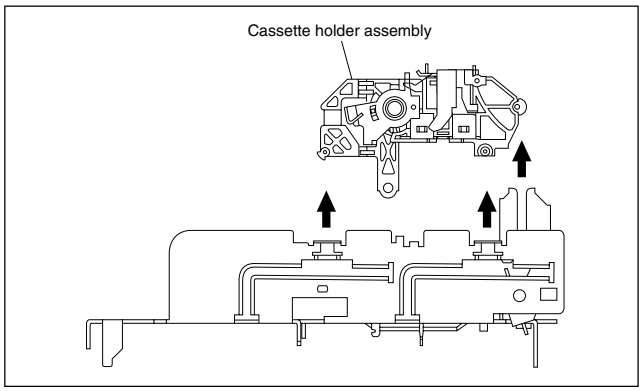


Fig. 2-2-3d

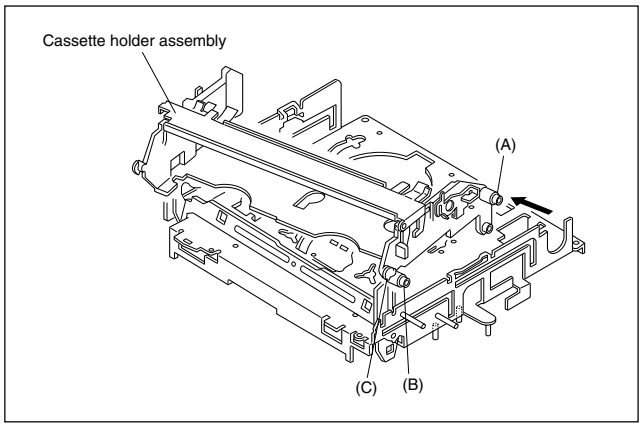


Fig. 2-2-3e

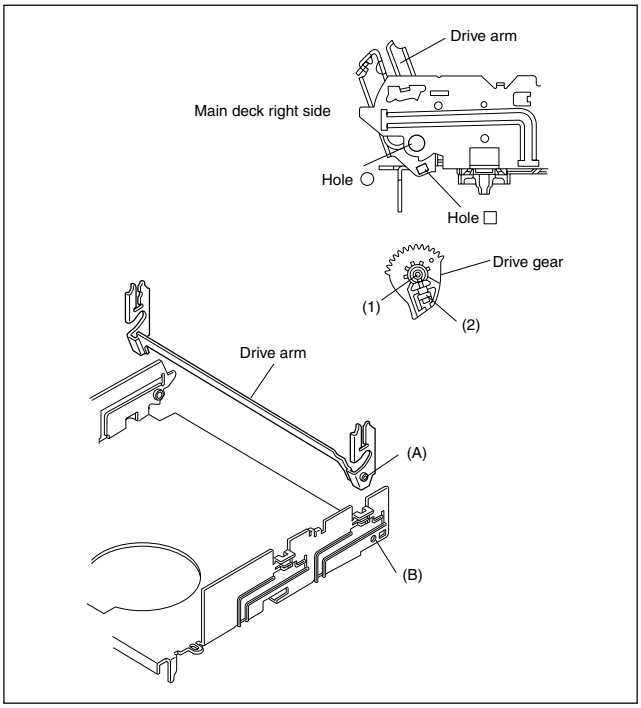


Fig. 2-2-3f

2. How to install (Phase matching)
(1) Insert the section (A) of the drive arm into the section (B) of the main deck.
(2) Insert the section (1) of the drive gear into the round hole, and the section (2) into the square hole on the drive arm. (See Fig.2-2-3f.)
(3) Hold the drive arm upright and fit the leg (C) on the right side of the cassette holder assembly into the groove. (See Fig.2-2-3g.)
(4) While swinging the lock lever (R) of the cassette holder assembly toward the front, put the legs (A) and (B) into the rail. (See Fig.2-2-3g.)
(5) Drop the three legs on the left side of the cassette holder assembly into the groove at one time. (See Fig.2-2-3h.)
(6) Slide the whole cassette holder assembly toward the front to bring it to the eject end position.
(7) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the guide hole on the main deck. (See Fig.2-2-3i.)
(8) Install so that the notch on the periphery of the relay gear is aligned with the notch of the main deck and that hole A of the relay gear is aligned with the hole A of the limit gear and that hole B of the relay gear is aligned with the hole B of the drive gear. (See Fig.2-2-3i.)
(9) Install the door opener, opener guide, spring(A) and cassette housing bracket and fasten the two slit washers.

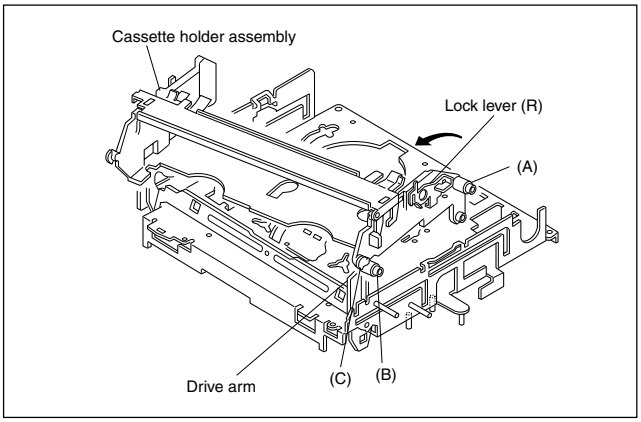


Fig. 2-2-3g

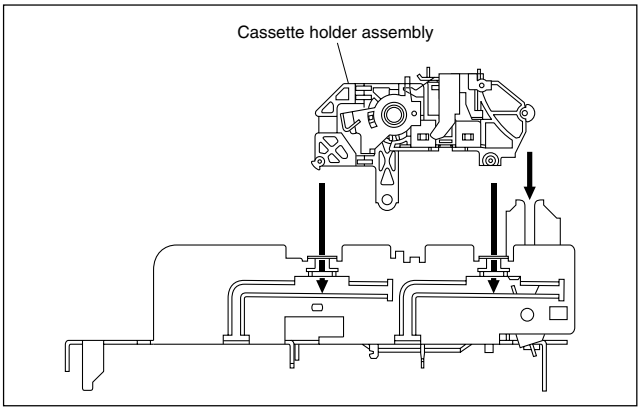


Fig. 2-2-3h

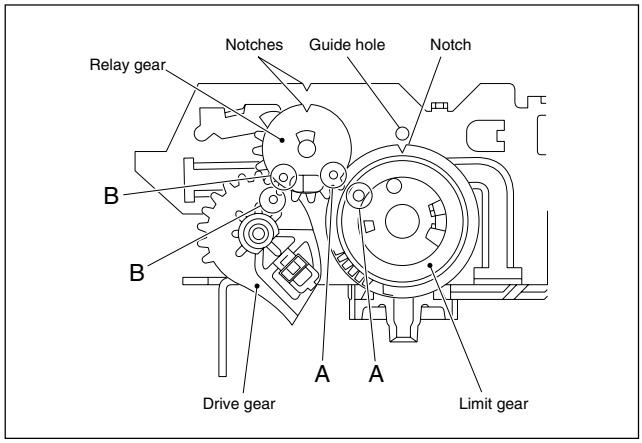


Fig. 2-2-3i

2.2.4 Pinch roller arm assembly

1. How to remove

(1) Remove the spring from the hook of the press lever assembly.
(2) Remove the slit washer and remove the pinch roller seat 2. (See Fig.2-2-4a.)
(3) Remove the pinch roller arm assembly by pulling it up.

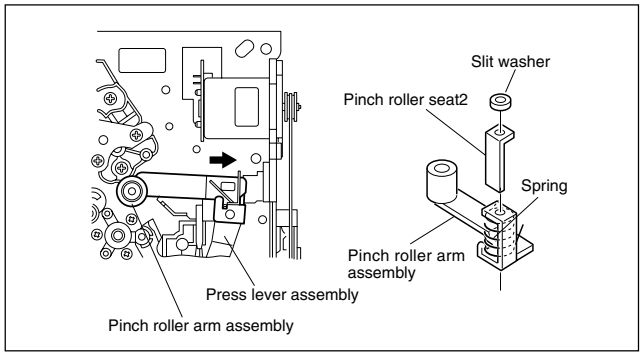


Fig. 2-2-4a

2.2.5 Guide arm assembly and press lever assembly

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm assembly by pulling it up.
(2) Remove the press lever assembly by pulling it up. (See Fig.2-2-5a.)

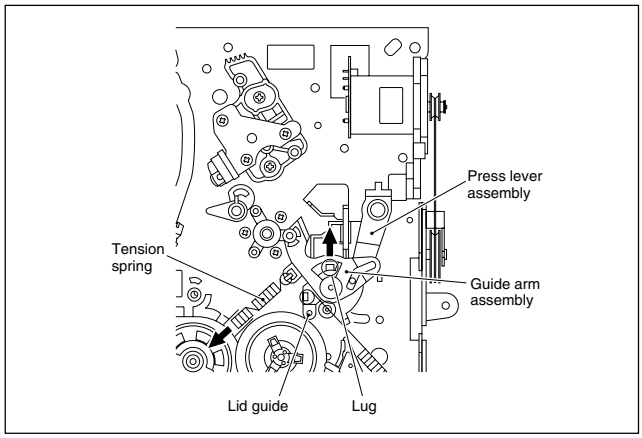


Fig. 2-2-5a

2.2.6 A/C head

1. How to remove

(1) Remove the two screws (A) and remove the A/C head together with the head base.
(2) When replacing only the A/C head, remove the three screws (B) while controlling the compression spring.

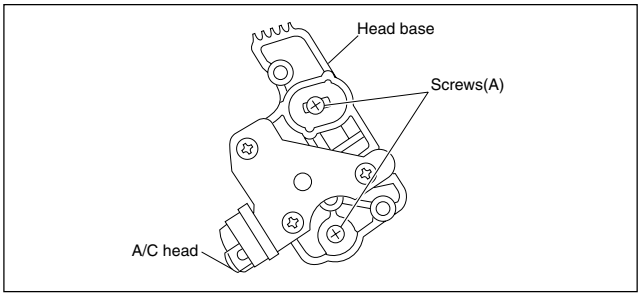


Fig. 2-2-6a

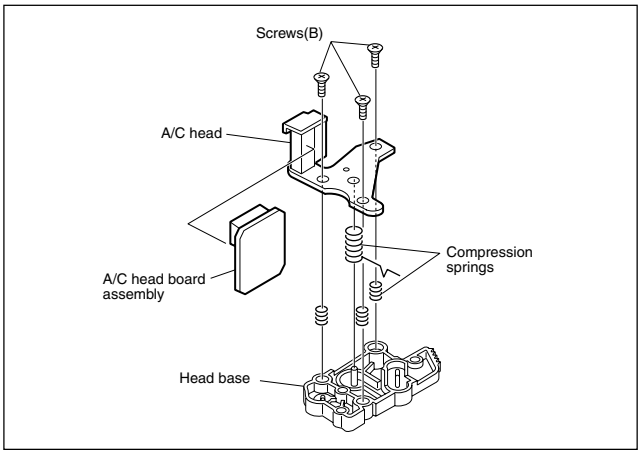


Fig. 2-2-6b

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-6c. Also make sure that the screw center (centre) is brought into alignment with the center (centre) position of the slot.

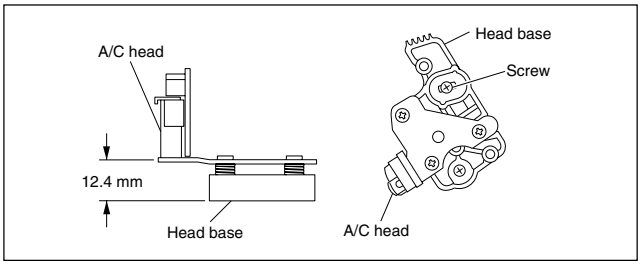


Fig. 2-2-6c

2.2.7 Loading motor

1. How to remove

(1) Remove the belt wound around the worm gear.
(2) Open the two lugs of the motor guide and remove the loading motor, loading motor board assembly and motor guide altogether by pulling them up.
(3) When replacing the loading motor board assembly, take care with the orientation of the loading motor. (Install so that the loading motor label faces upward.)
(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-7a.

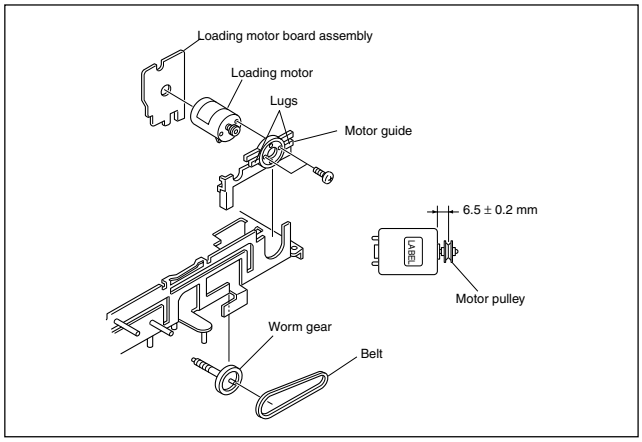


Fig. 2-2-7a

2.2.8 Capstan motor

1. How to remove

(1) Remove the belt (capstan) on the mechanism assembly back side.
(2) Remove the three screws (A) and remove the capstan motor.

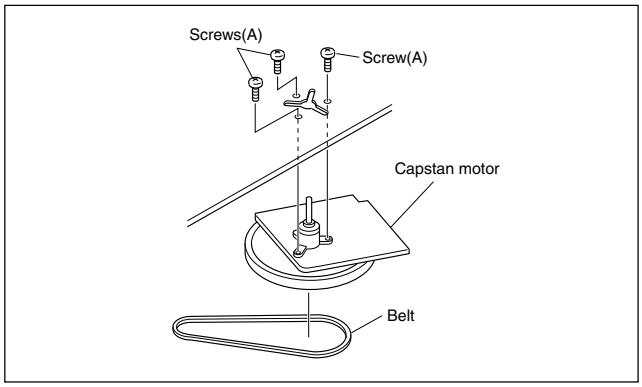


Fig. 2-2-8a

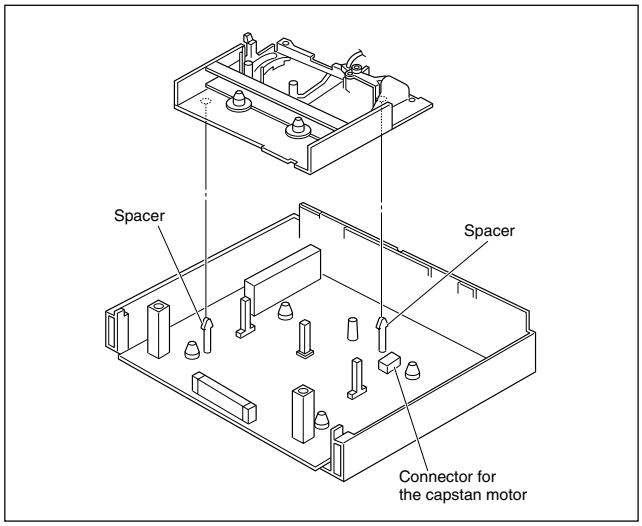


Fig. 2-2-8b

2. How to install (Centering the mounting position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.
(The capstan motor is centrally located when the unit is shipped from the factory.)

(1) Provisionally tighten the three screws (A) securing the capstan motor.
(2) Install the mechanism assembly to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism.)
Make sure that all the connectors for the mechanism assembly and the Main board assembly are correctly installed as indicated in Fig. 2-2-8b.
(3) Making sure that the connector for the capstan motor is correctly mounted, and securely tighten the three screws (A).

Note:

- ***When the capstan motor has been replaced with a new one, perform recording in the EP(or LP) mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).***

2.2.9 Pole base assembly (supply or take-up side)

1. How to remove

(1) Remove the UV catcher 2 on the removal side by loosening the screw (A).
(2) Remove the pole base assembly on the supply side from the mechanism assembly by loosening the screw (B) on the mechanism assembly back side and sliding the pole base assembly toward the UV catcher 2.
(3) As for the pole base assembly on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate. (See the “Procedures for Lowering the Cassette holder assembly” of 1.3 DISASSEMBLY/ASSEMBLY METHOD.) Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing the screw (B).

Note:

- ***After reinstalling the Pole base assembly and the UV catcher2, be sure to perform compatibility adjustment.***

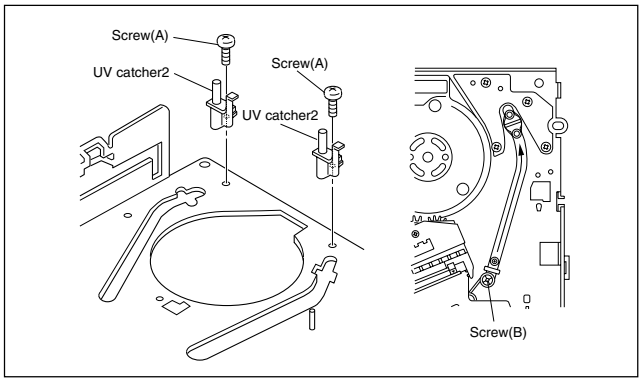


Fig. 2-2-9a

2.2.10 Rotary encoder

1. How to remove

(1) Remove the screw (A) and remove the rotary encoder by pulling it up. (See Fig. 2-2-10a.)

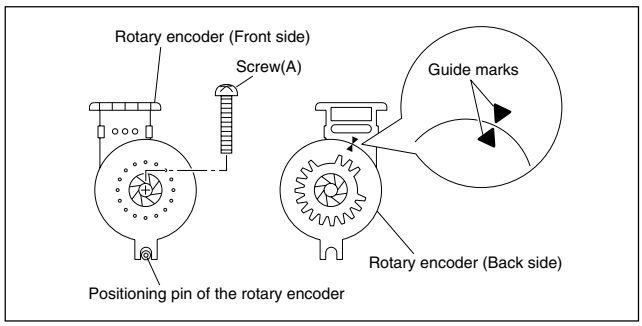


Fig. 2-2-10a

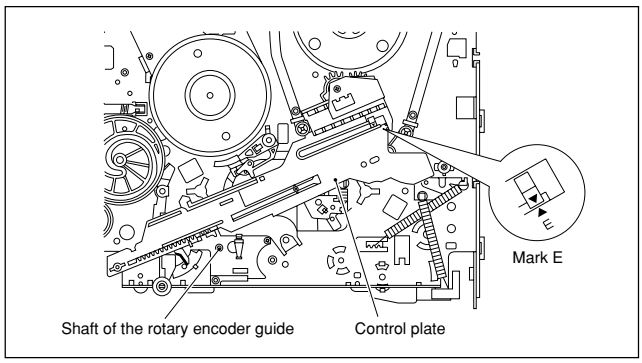


Fig. 2-2-10b

2. How to install (Phase matching)

(1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the guide marks on the rotary encoder into alignment as indicated in Fig.2-2-10a. (See Fig. 2-2-10a and Fig. 2-2-10b.)

(2) Turn over the rotary encoder with its guide marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.

(3) Tighten the screw (A) to complete the installation.

2.2.11 Clutch unit

(1) Remove the belt wound around the capstan motor and the clutch unit.

(2) Remove the slit washer and remove the clutch unit.

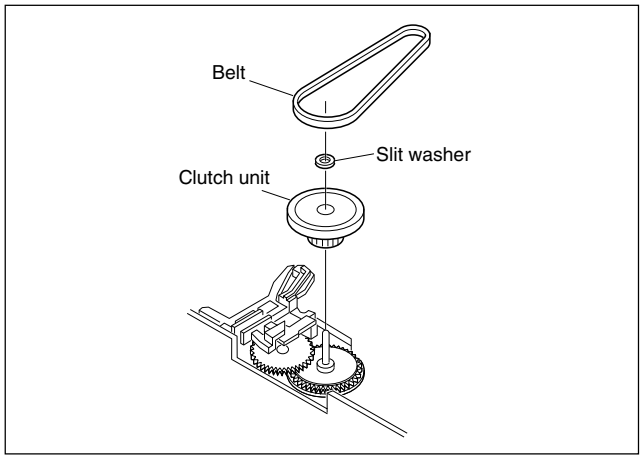


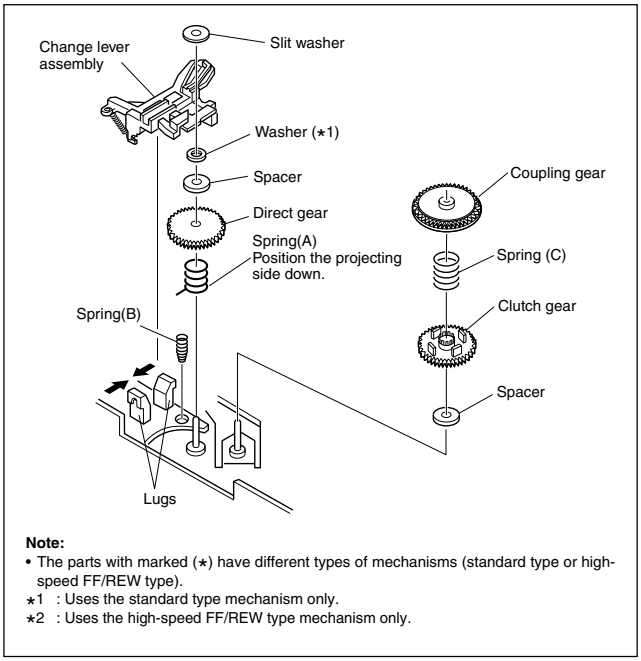
Fig. 2-2-11a

2.2.12 Change lever assembly, direct gear, clutch gear and coupling gear

1. How to remove

(1) Release the two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever assembly.

(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care so as not to lose the washer and spring. (See Fig.2-2-12a.)



Note:
- The parts with marked (*) have different types of mechanisms (standard type or high-speed FF/REW type).

*1 : Uses the standard type mechanism only.
*2 : Uses the high-speed FF/REW type mechanism only.

Fig. 2-2-12a

2. How to install

(1) Install the clutch gear, spring (A), spring (C), direct gear, spacer and others to the individual shafts of the main deck, and finally the slit washer. (See Fig.2-2-12a.)

(2) Let the spring (B) drops into the rotary encoder guide hole and install the change lever assembly.(Take care not to mistake a direction of the spring.) The point is to slightly lift the coupling gear and catch it from the both sides with the assembly. (See Fig.2-2-12b.)

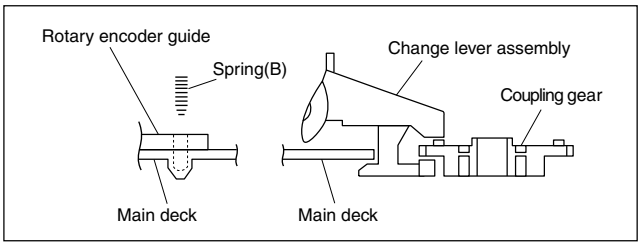


Fig. 2-2-12b

2.2.13 Link lever

1. How to remove

(1) Remove the two slit washers.
(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the locking section of the control plate.

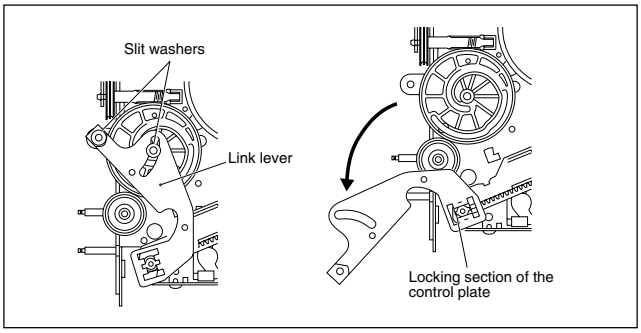


Fig. 2-2-13a

2. How to install (Phase matching)

(1) Slide the control plate so that its mark E is aligned with the mark ▼ on the loading arm gear shaft. (See Fig.2-2-13b.)
(2) Rotate the worm gear until the guide hole of the control cam is aligned exactly with the guide hole of the main deck. (See Fig.2-2-13c.)
(3) Insert the link lever into the locking section of the control plate. (See Fig.2-2-13a.)
(4) Rotate the link lever clockwise so that it is installed on the shafts in the center (centre) and on the left of the control cam.
(5) Fasten the slit washers at these two points.

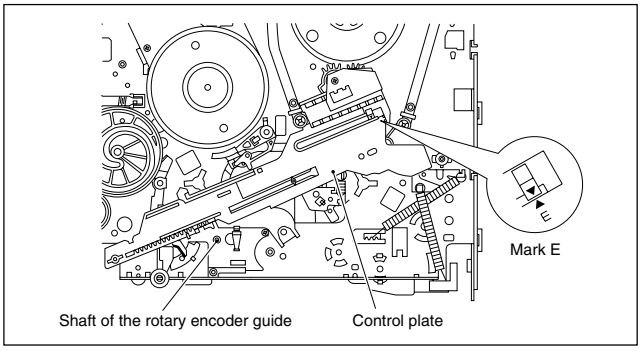


Fig. 2-2-13b

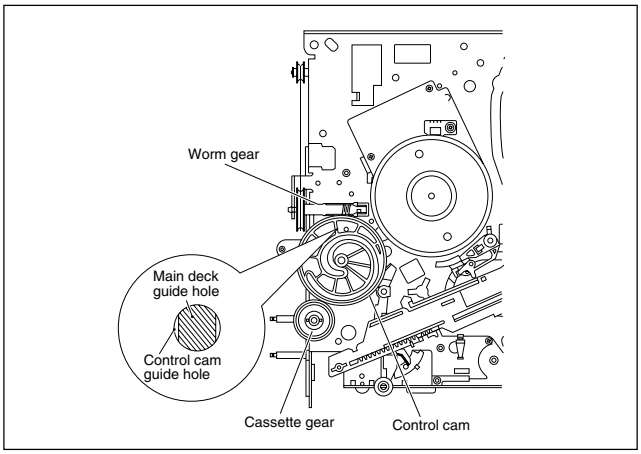


Fig. 2-2-13c

2.2.14 Cassette gear, control cam and worm gear

1. How to remove

(1) Remove the control cam by lifting it.
(2) Open the two lugs of the cassette gear outward and pull the latter off.
(3) Remove the belt wound around the worm gear and the loading motor.
(4) Open the lug of the lid guide outward and remove the worm gear.

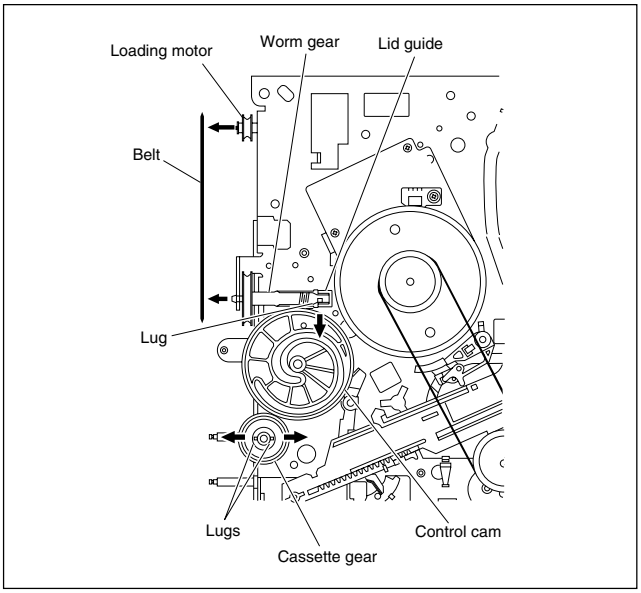


Fig. 2-2-14a

2.2.15 Control plate

1. How to remove

(1) Remove the screw (A) retaining the control bracket 1 and remove the latter.
(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-15a.)

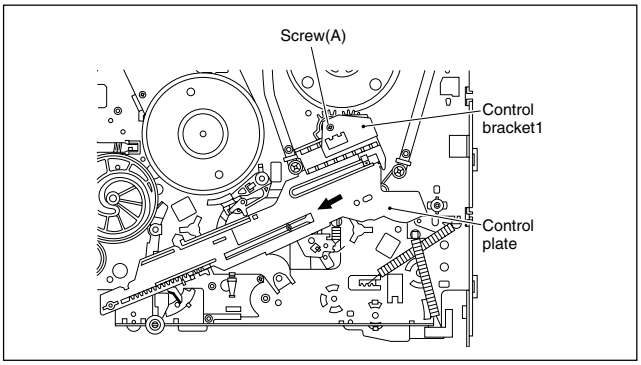


Fig. 2-2-15a

2. How to install (Phase matching)

(1) Adjust the position of the idler arm assembly pin as indicated in Fig.2-2-15b (to the left of center (centre) of the R section).
(2) Bring the guide hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Install the control plate so that the section A of the loading arm gear shaft fits into the hole (A) of the control plate, the section B of the control plate guide into the hole (B), and the control plate comes under the section C of the rotary encoder guide and the section D of the loading arm gear shaft while press-fit the pole base assmebly (supply side) as indicated by the arrow. It is important that the tension arm assembly shaft is positioned closer toward you than the control plate. (See Fig.2-2-15c.)
(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-15c.)
(5) Pull off the hexagonal wrench for positioning.

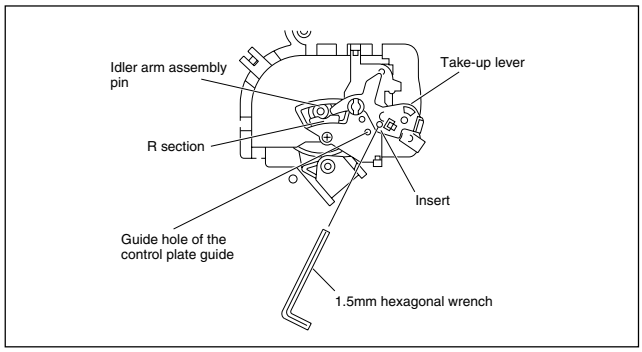


Fig. 2-2-15b

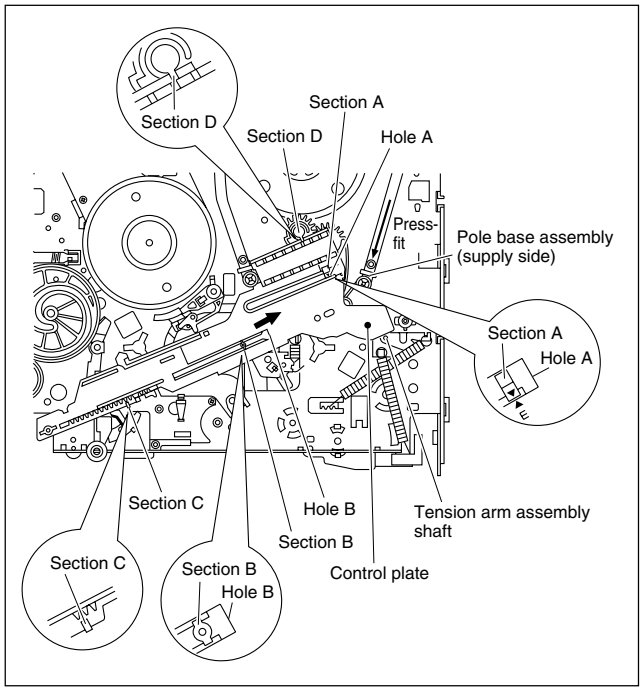


Fig. 2-2-15c

2.2.16 Loading arm gear (supply or take-up side) and loading arm gear shaft

1. How to remove

(1) Remove the loading arm gear (supply side) by loosening the screw (A). (See Fig. 2-2-16a.)
(2) Remove the screw (B) and remove the torsion arm from the pole base assembly (take-up side). (See Fig.2-2-16a.)
(3) Turn the loading arm gear (take-up side) clockwise so that the notch of the loading arm gear (take-up side) is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise so that the notch is in alignment with the projection and remove the loading arm gear (take-up side). (See Fig.2-2-16a and Fig. 2-2-16b.)
(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove the screw (C) and remove the loading arm gear shaft by sliding it.

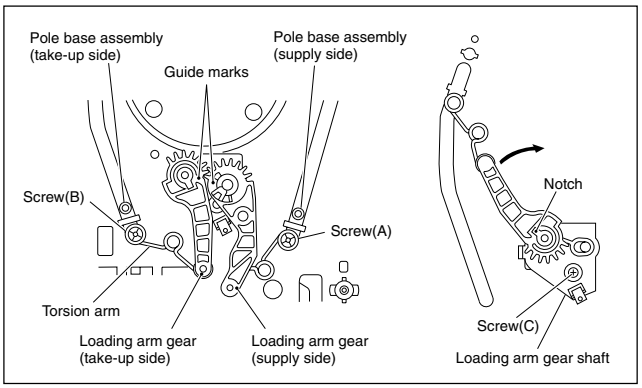


Fig. 2-2-16a

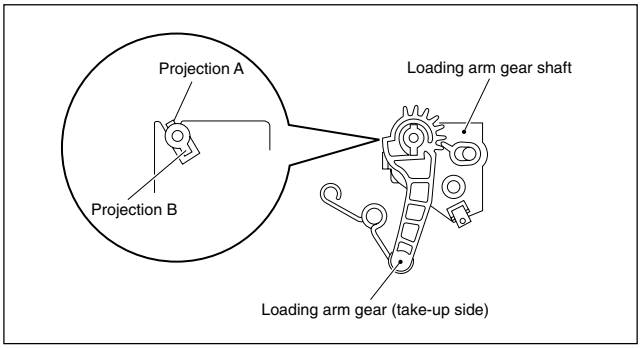


Fig. 2-2-16b

2. How to install

(1) Align the notch of the loading arm gear (take-up side) to the projection B of the loading arm gear shaft and slip it over. Then rotate it clockwise for alignment with the projection A and slip it down to the bottom. (See Fig.2-2-16b.)
(2) Then turn the loading arm gear (take-up side) counterclockwise. Hang the torsion arm on the pole base assembly (take-up side) and tighten the screw (B).
(3) Install the loading arm gear (supply side) so that the guide mark of the loading arm gear (take-up side) is in alignment with the guide mark of the loading arm gear (supply side). Then hang the torsion arm on the pole base assembly (supply side) and tighten the screw (A). (See Fig.2-2-16a.)

2.2.17 Take-up lever, take-up head and control plate guide

(1) Remove the spring of the take-up lever from the main deck.
(2) Remove the lug (A) of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.
(3) Remove the screw (A).
(4) Align the idler arm assembly pin in the center (centre) of the R section of the control plate guide, remove the control plate guide lugs (B) and (C) from the main deck, and remove the control plate guide.

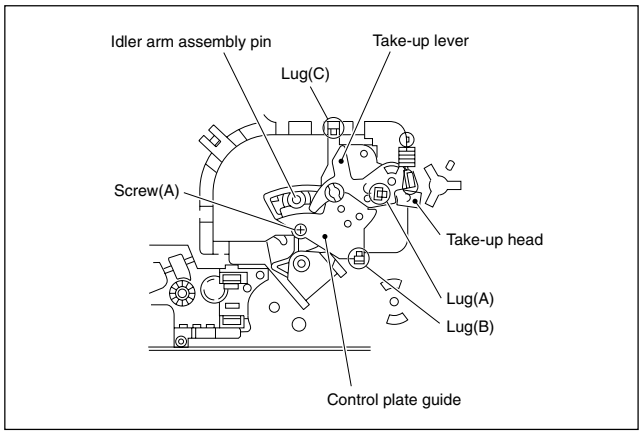


Fig. 2-2-17a

2.2.18 Capstan brake assembly

1. How to remove

(1) Move the lug (A) of the capstan brake assembly in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-18a.)
(2) Remove the lug (B) of the capstan brake assembly from the main deck and remove the capstan brake assembly.

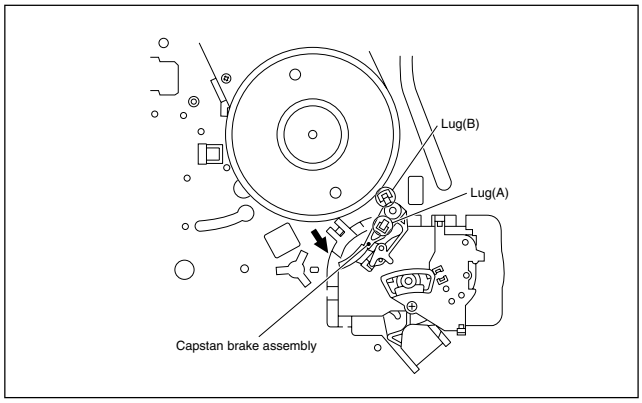


Fig. 2-2-18a

2.2.19 Sub brake assembly (take-up side)

1. How to remove

(1) Remove the spring attached to the lid guide and sub brake assembly (take-up side).
(2) Bring the lug (A) of the sub brake assembly (take-up side) into alignment with the notch of the main deck.
(3) Remove the lugs (B) and (C) of the sub brake assembly (take-up side) from the main deck and remove the sub brake assembly (take-up side).

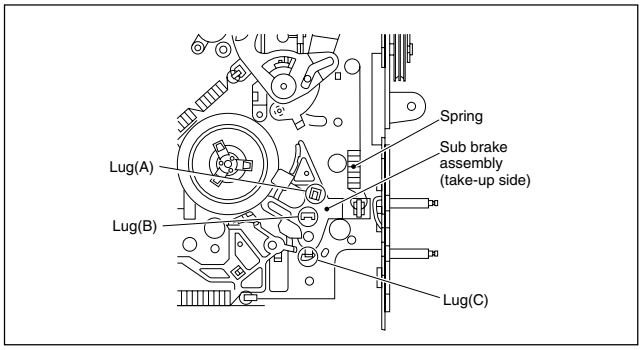


Fig. 2-2-19a

2.2.20 Main brake assembly (take-up side), reel disk (take-up side) and main brake assembly (supply side)

1. How to remove

(1) Move the main brake assembly (take-up side) in the arrow-indicated direction and remove the reel disk (take-up side).
(2) Remove the spring attached to the main brake assembly.
(3) Remove the lug (A) of the main brake assembly (take-up side) and pull out the lug (B) after bringing it into alignment with the main deck notch.
(4) Remove the lugs (C), (D) and (E) of the main brake assembly (supply side) from the main deck and pull them off. (See Fig.2-2-20a.)
(5) When installing the main brake assembly (take-up side), slide the brake lever in the direction as indicated by the arrow to prevent it from hitting the projection of the main brake assembly (take-up side). (See Fig.2-2-20b.)

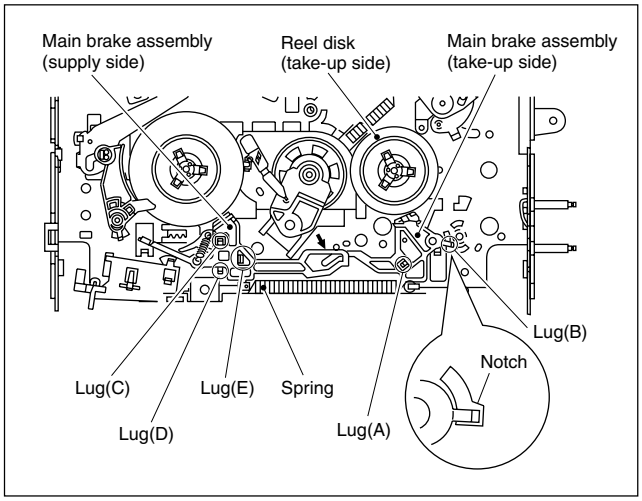
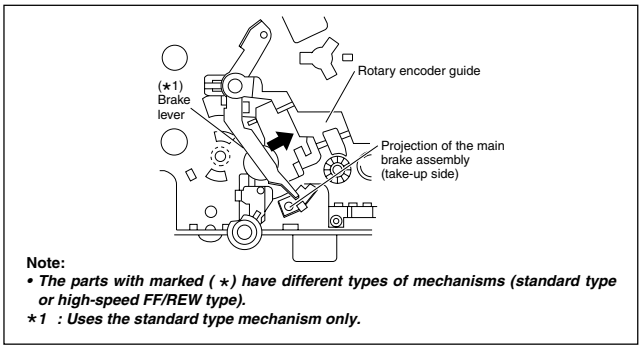


Fig. 2-2-20a



Note:
• The parts with marked (∗) have different types of mechanisms (standard type or high-speed FF/REW type).
∗1 : Uses the standard type mechanism only.

Fig. 2-2-20b

2.2.21 Tension brake assembly, reel disk (supply side) and tension arm assembly

1. How to remove

(1) Remove the three lugs of the tension brake assembly from the main deck and pull them off.
(2) Remove the reel disk (supply side) by loosening in the arrow-indicated direction the main brake assembly (supply side).
(3) Remove the tension spring on the back of the main deck. Then release the lug of the tension arm bearing in the arrow-indicated direction and draw out the tension arm assembly. (See Fig. 2-2-21a.)

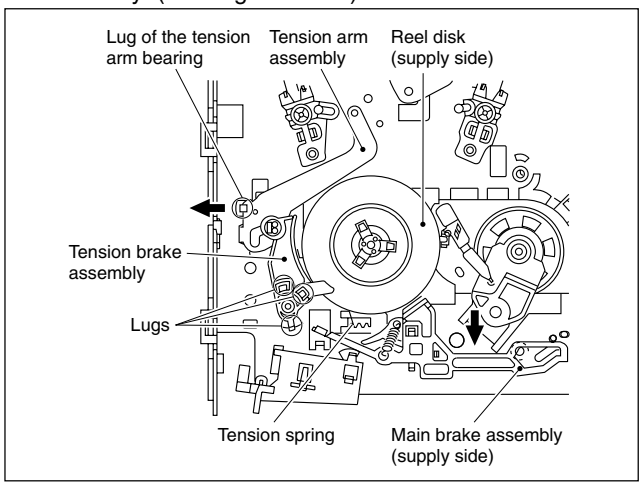


Fig. 2-2-21a

2.2.22 Idler lever, idler arm assembly

1. How to remove

(1) Remove the lug of the idler lever from the main deck and remove the hook fitted in the idler arm assembly hole by lifting it.
(2) Remove the slit washer and pull out the idler arm assembly.

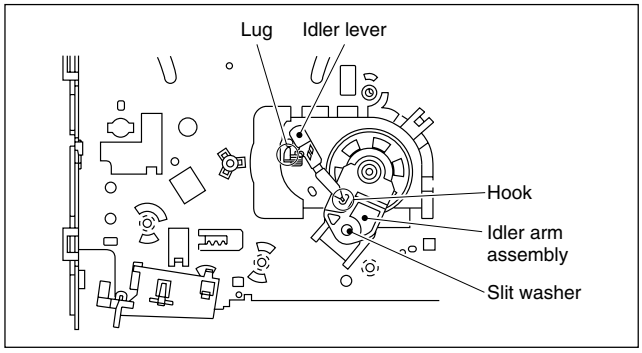


Fig. 2-2-22a

2.2.23 Stator assembly

(1) Remove the flat cable.
(2) Remove the two screws (A), (B) and remove the lug wire.
(3) Remove the stator assembly by lifting in the arrow-indicated direction. (Take care that the brush spring does not jump out.)

Notes:

- ***Be careful not to lose the brush and spring.***
- ***There are some models that do not use the lug wire. Refer to the parts list for these models.***
- ***When tightening the screw (B), place the caulked part of the lug terminal near to the shaft of the drum and then tighten it.***
- ***After installation, be sure to perform the switching point adjustment according to the electrical adjustment procedure.***

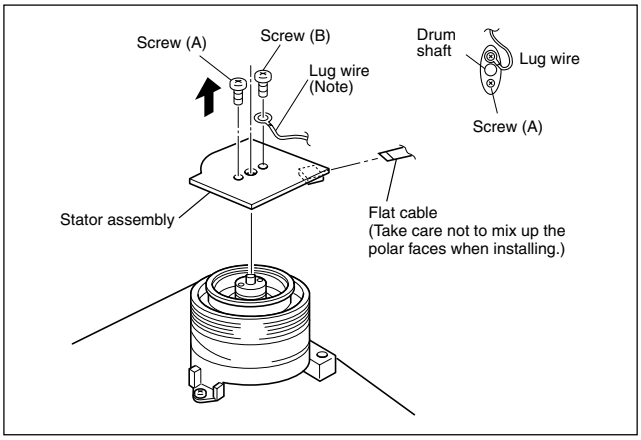


Fig. 2-2-23a

2.2.24 Rotor assembly

1. How to remove

(1) Remove the stator assembly.
(2) Remove the two screws (B) and remove the rotor assembly.

2. How to install

(1) Match the phases of the upper drum assembly and the rotor assembly as indicated in Fig.2-2-24a.
(2) Place the upper drum assembly hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-24a.)

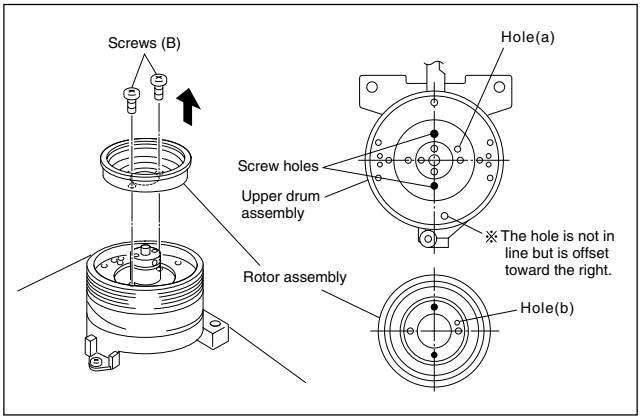


Fig. 2-2-24a

2.2.25 Upper drum assembly

Notes:

- ***To replace the upper drum assembly only may not be possible with some models. For upper drum assembly replacement, refer to the parts list. (When the parts number of the upper drum assembly is not listed on the parts list, then this cannot be replaced.)***
- ***When replacement is required, control the up- down movement of the brush. Never apply grease.***
- ***When replacing the upper drum assembly, replace it the together with the washer.***

1. How to remove

(1) Remove the stator assembly and rotor assembly.
(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
(3) Remove the upper drum assembly and remove the washer using tweezers.

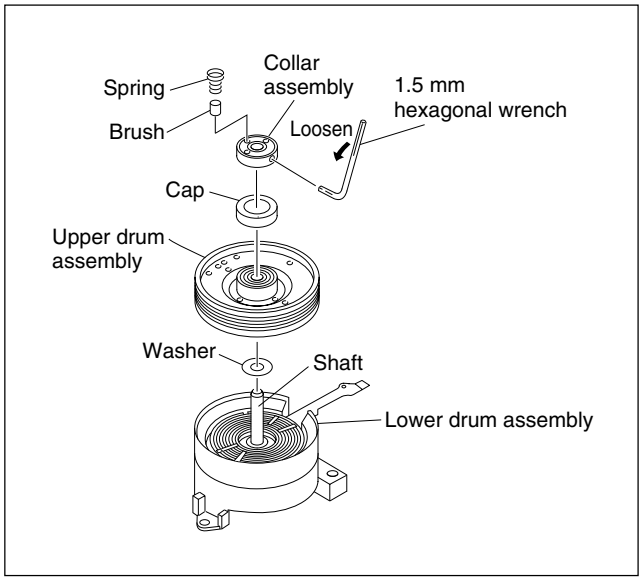


Fig. 2-2-25a

2. How to install

(1) Clean the coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-25b.)
(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-25a.)
(3) Install the cap to the upper drum assembly.
(4) Position the collar assembly as indicated in Fig.2-2-25c while controlling its up- down movement.
(5) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.
(6) After installation, gently turn the upper drum assembly with your hand to make sure that it turns normally. Then install the brush and the spring.
(7) Install the rotor assembly and stator assembly according to Fig 2-2-23a and 2-2-24a.
(8) When installation is complete, clean the upper drum assembly and lower drum assembly and carry out the following adjustments.
    - PB switching point adjustment
    - Slow tracking adjustment
    - Compatibility adjustment (Be sure to check for compatibility for the EP (or LP) mode.)

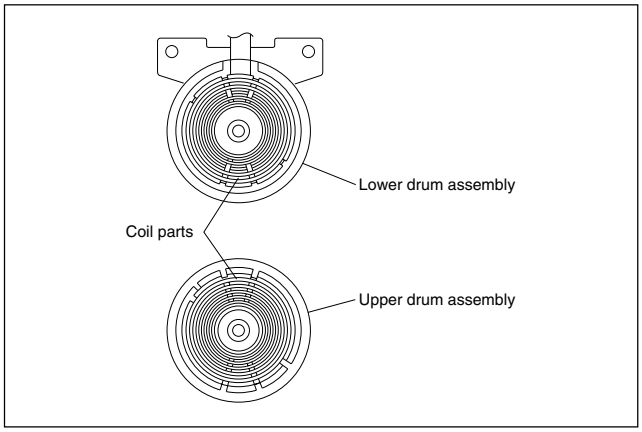


Fig. 2-2-25b

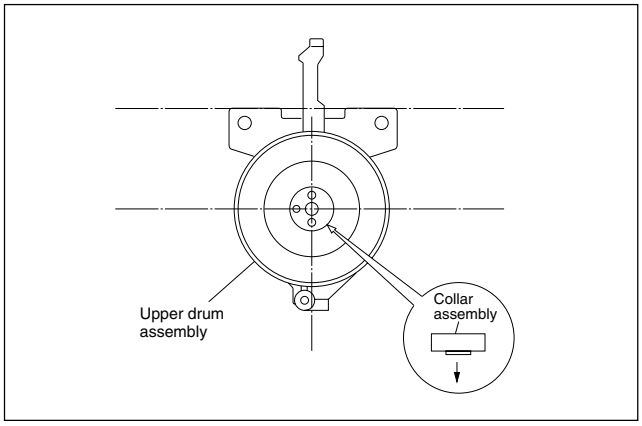


Fig. 2-2-25c

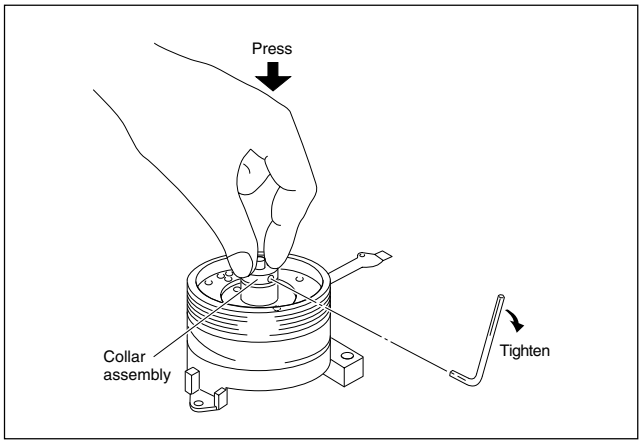


Fig. 2-2-25d

2.3 Compatibility adjustment

Notes:

- ***Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the A/C head, drum assembly or any part of the tape transport system.***
- ***To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.***
- ***Unless otherwise specified, all measuring points and adjustment parts are located on the Main board.***
- ***When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). (See SECTION 1 DISASSEMBLY.)***

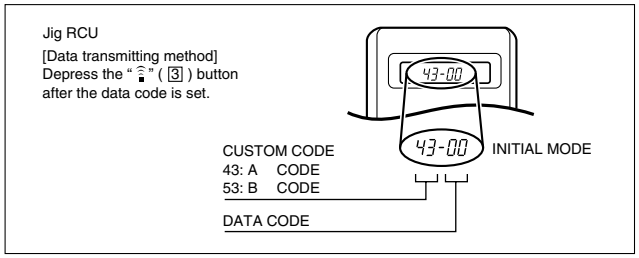


Fig. 2-3a Jig RCU [PTU94023B]

2.3.1 FM waveform linearity

Signal	(A1) (A2)	• Alignment tape(SP, stairstep, PAL) [MHPE] • Alignment tape(LP, stairstep, PAL) [MHPE-L]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Guide roller [Mechanism assembly]
Specified value	(G)	• Flat V.PB FM waveform
Adjustment tool	(H)	• Roller driver [PTU94002]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Make sure that there is no significant level drop of the V.PB FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig. 2-3-1a.)
(5) Reduce the V.PB FM waveform by the tracking operation. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver to make the V.PB FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the roller driver to make it linear. (See Fig. 2-3-1c.)
(6) Make sure that the V.PB FM waveform varies in parallel and linearly with the tracking operation again. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play back the alignment tape (A1) again and confirm the V.PB FM waveform.
(8) After adjustment, confirm that the tape wrinkling does not occur at the roller upper or lower limits. (See Fig. 2-3-1d.)

[Perform adjustment step (9) only for the models equipped with SP mode and EP (or LP) mode.]

(9) Repeat steps (1) to (8) by using the alignment tape (A2).

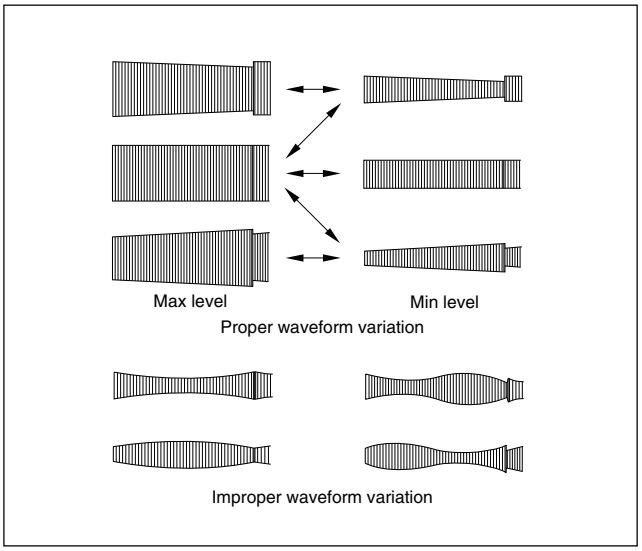


Fig. 2-3-1a

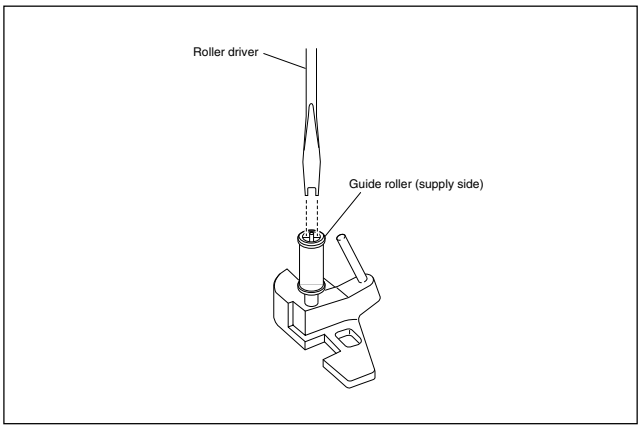


Fig. 2-3-1b

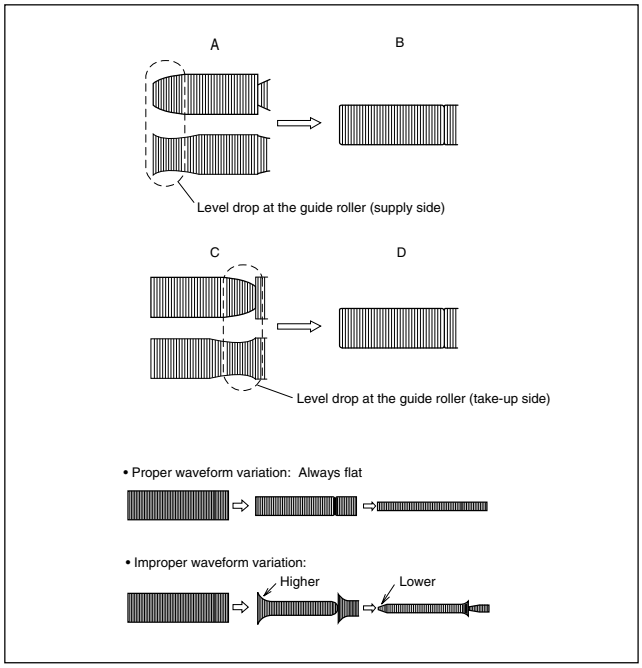


Fig. 2-3-1c

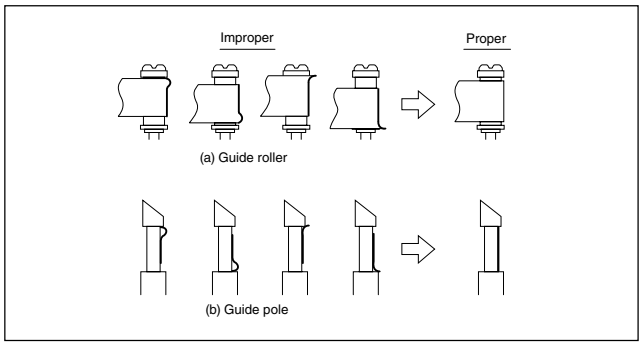


Fig. 2-3-1d

2.3.2 Height and tilt of the A/C head

Note:

- ***Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See Fig.2-2-6c.)***

Signal	(A)	• Alignment tape(SP, stairstep, PAL) [MHPE]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• AUDIO OUT terminal • TP4001 (CTL. P)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head [Mechanism assembly]
Specified value	(G)	• Maximum waveform

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the AUDIO OUT waveform and Control pulse waveform at the measuring points (D1) and (D2) in the ALT mode.
(3) Set the VCR to the manual tracking mode.
(4) Adjust the AUDIO OUT waveform and Control pulse waveform by turning the screws (1), (2) and (3) little by little until both waveforms reach maximum. The screw (1) and (3) are for adjustment of tilt and the screw (2) for azimuth.

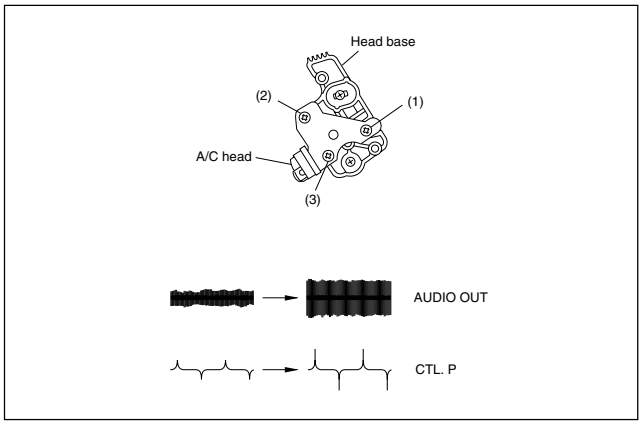


Fig. 2-3-2a

2.3.3 A/C head phase (X-value)

Signal	(A1)	• Alignment tape(SP, stairstep, PAL) [MHPE]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• A/C head base [Mechanism assembly]
Specified value	(G)	• Maximum V.PB FM waveform
Adjustment tool	(H)	• A/C head positioning tool [PTU94010]

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Set the VCR to the manual tracking mode.
(4) Loosen the screws (4) and (5), then set the A/C head positioning tool to the innermost projected part of the A/C head. (See Fig. 2-3-3a.)
(5) Turn the A/C head positioning tool fully toward the capstan. Then turn it back gradually toward the drum and stop on the second peak point position of the V.PB FM waveform output level. Then tighten the screws (4) and (5).
(6) Perform the tracking operation and make sure that the V.PB FM waveform is at its maximum.
If it is not at maximum, loosen the screws (4) and (5), and turn the A/C head positioning tool to bring the A/C head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

[Perform adjustment steps (7) to (10) only for 2 Head models equipped with LP mode.]

(7) Then play back the alignment tape (A2).
(8) Set the VCR to the manual tracking mode.
(9) Perform the tracking operation and make sure that the V.PB FM waveform is at its maximum.
(10) If it is not at maximum, loosen the screws (4) and (5), and turn the A/C head positioning tool to bring the A/C head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

Note:

- ***After adjusting, always perform the confirmation and re-adjustment of the item 2.3.4.***

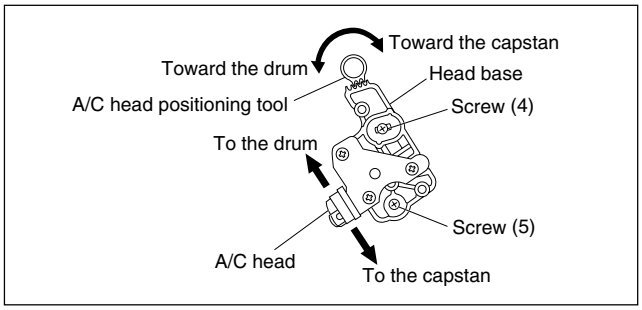


Fig. 2-3-3a

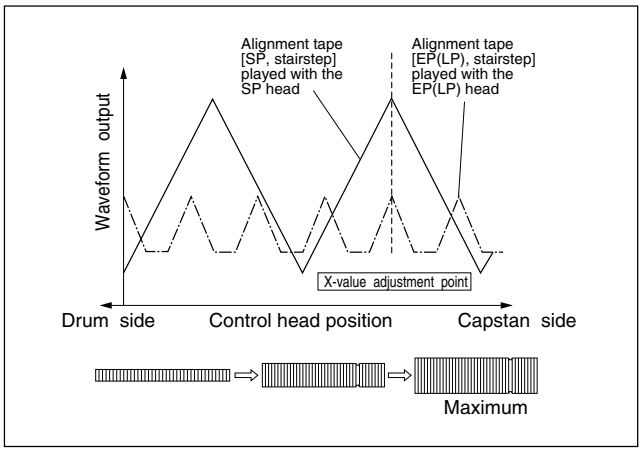


Fig. 2-3-3b

2.3.4 Standard tracking preset

Signal	(A)	• Alignment tape(LP, stairstep, PAL) [MHPE-L]
Mode	(B)	• PB → Auto adjust
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)
Adjustment part	(F)	• Jig RCU: Code “50”
Specified value	(G)	• STOP mode (Maximum V.PB FM waveform)
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Confirm that the automatic tracking operation is completed.
(4) Set the VCR to the Auto adjust mode by transmitting the code (F) twice from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed.
(5) If the VCR enters the eject mode, perform adjustment for the audio control head phase (X-value) again.

2.3.5 Tension pole position

Signal	(A)	• Back tension cassette gauge [PUJ48076-2]
Mode	(B)	• PB
Adjustment part	(F)	• Adjust pin [Mechansim assembly]
Specified value	(G)	• 25 - 51 gf•cm ($2.45 - 5 \times 10^{-3}$ Nm]

(1) Play back the back tension cassette gauge (A).
(2) Check that the indicated value on the left side gauge is within the specified value (G).
(3) If the indicated value is not within the specified value (G), perform the adjustment in a following procedure.
  1) Set the VCR to the mechanism service mode. (See SECTION 1 DISASSEMBLY.)
  2) Set the VCR to the play back mode and adjust by turning adjustment pin to align the tension arm assembly edge with the main deck hole (A) on the right edge marker. (See Fig. 2-3-5a)

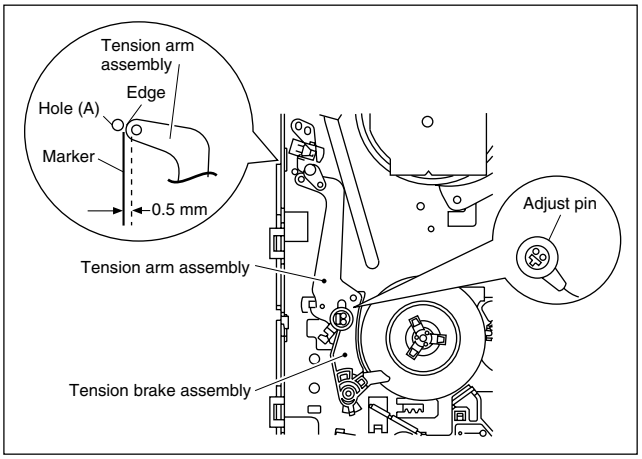
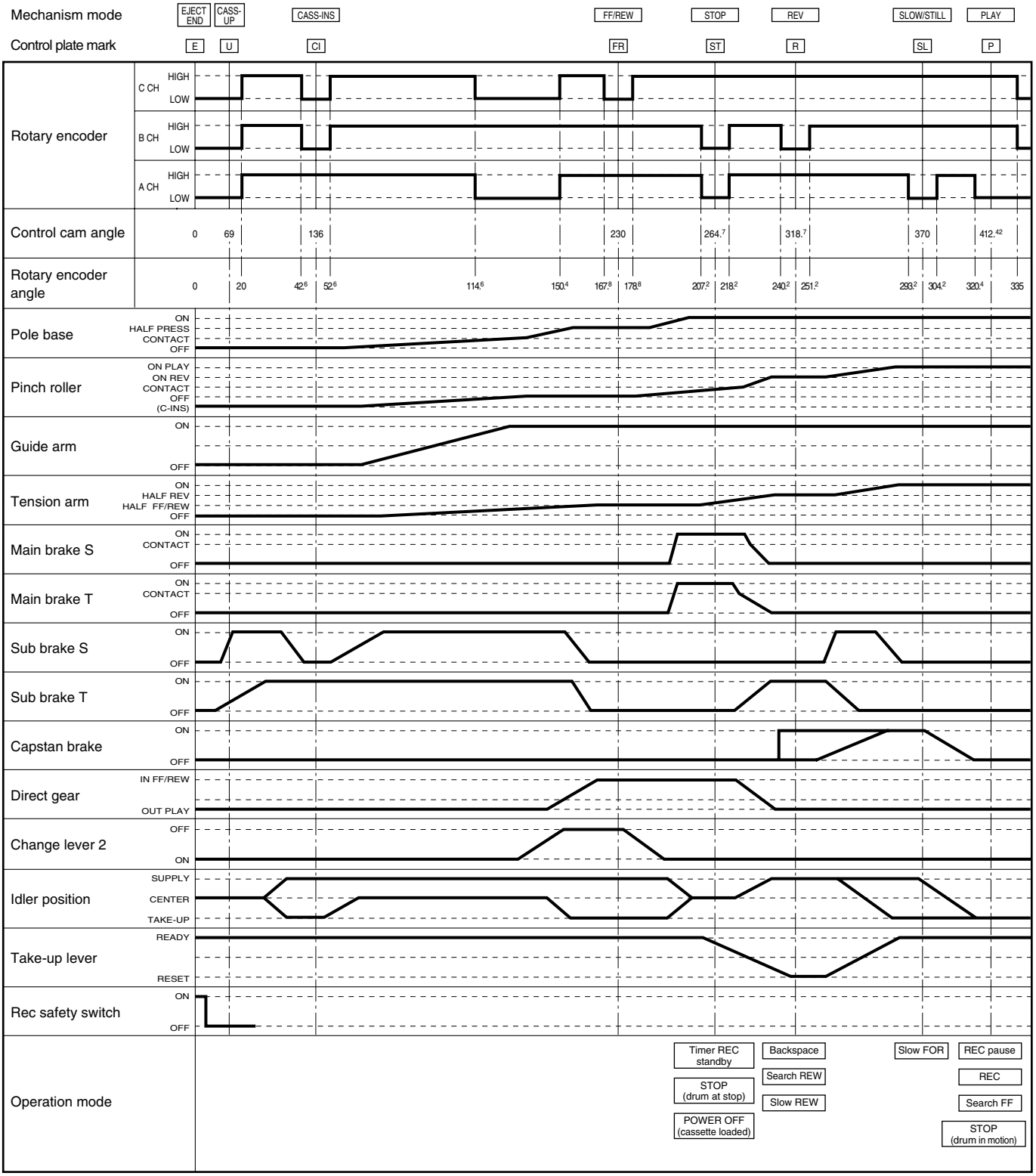


Fig. 2-3-5a

Mechanism Timing Chart



SECTION 3
ELECTRICAL ADJUSTMENT

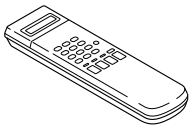
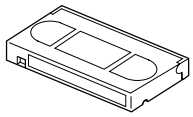
3.1 Precaution

The following adjustment procedures are not only necessary after replacement of consumable mechanical parts or board assemblies, but are also provided as references to be referred to when servicing the electrical circuitry.
In case of trouble with the electrical circuitry, always begin a service by identifying the defective points by using the measuring instruments as described in the following electrical adjustment procedures. After this, proceed to the repair, replacement and/or adjustment. If the required measuring instruments are not available in the field, do not change the adjustment parts (variable resistor, etc.) carelessly.

3.1.1 Required test equipments

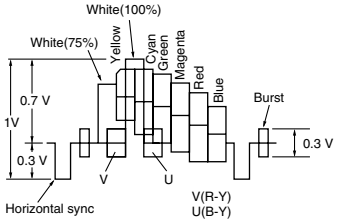
- Color (colour) television or monitor
- Oscilloscope: wide-band, dual-trace, triggered delayed sweep
- Signal generator: RF / IF sweep / marker
- Frequency counter
- Signal generator: stairstep, color (colour) bar [PAL]
- Recording tape
- Digit-key remote controller(provided)

3.1.2 Required adjustment tools

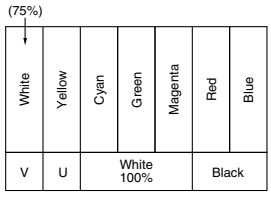
Jig RCU PTU94023B	Alignment tape (SP, stairstep, PAL) MHPE
	

3.1.3 Color (colour) bar signal, color (colour) bar pattern

• Color(colour) bar signal [PAL]



• Color(colour) bar pattern [PAL]



3.1.4 Switch settings and standard precautions

The SW settings of the VCR and the standard precautions for the electrical adjustments are as follows.

- ***When using the Jig RCU, it is required to set the VCR to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). (See SECTION 1 DISASSEMBLY.)***

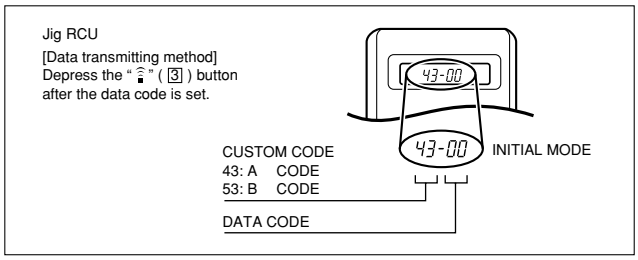


Fig. 3-1-4a Jig RCU [PTU94023B]

- ***Set the switches as shown below unless otherwise specified on the relevant adjustment chart. The switches that are not listed below can be set as desired.***
  If the VCR is not equipped with the functions detailed below, setup is not required.

AUTO PICTURE/VIDEO CALIBRATION/ B.E.S.T./D.S.P.C.	OFF
PICTURE CONTROL/SMART PICTURE	NORMAL/NATURAL
VIDEO STABILIZER	OFF
TBC	ON
Digital 3R	ON
VIDEO NAVIGATION/TAPE MANAGER	OFF

- ***If there is a reference to a signal input methed in the signal column of the adjustment chart, "Ext. S-input" means the Y/C separated video signal and "Ext. input" means the composite video signal input.***
- ***Unless otherwise specified, all measuring points and adjustment parts are located on the Main board.***

3.2 Servo circuit

3.2.1 Switching point

Signal	(A1) (A2)	• Stairstep signal • Alignment tape (SP,stairstep,PAL) [MHPE]
Mode	(B)	• PB
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2)	• VIDEO OUT terminal (75Ω terminated) • TP106 (PB. FM)
External trigger	(E)	• TP111 (D.FF)/slope : –
Adjustment part	(F)	• Jig RCU: Code “5A”
Specified value	(G)	• 6.5 ± 0.5H
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Play back the signal (A1) of the alignment tape (A2).
(2) Apply the external trigger signal to D.FF (E) to observe the VIDEO OUT waveform and V.PB FM waveform at the measuring points (D1) and (D2).
(3) Set the VCR to the manual tracking mode.
(4) Adjust tracking so that the V.PB FM waveform becomes maximum.
(5) Set the VCR to the Auto adjust mode by transmitting the code (F) from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed.
(6) If the VCR enters the eject mode, repeat steps (1) to (5) again.
(7) Play back the alignment tape (A2) again, confirm that the switching point is the specified value (G).

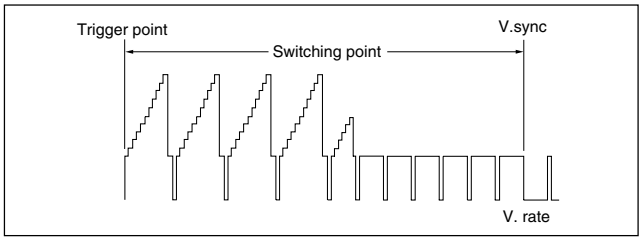


Fig. 3-2-1a Switching point

3.2.2 Slow tracking preset

Signal	(A1) (A2)	• Ext. input • Color (colour) bar signal [PAL]
Mode	(B1) (B2)	• VHS SP • VHS LP
Measuring point	(D)	• TV-Monitor
Adjustment part	(F)	• Jig RCU: Code “71“ or “72”
Specified value	(G)	• Minimum noise
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Record the signal (A2) in the mode (B1), and play back the recorded signal.
(2) Set the VCR to the manual tracking mode.
(3) Set the VCR to the FWD slow (+1/6x) mode.
(4) Transmit the code (F) from the Jig RCU to adjust so that the noise bar becomes the specified value (G) on the TV monitor in the slow mode.
(5) Set the VCR to the Stop mode.
(6) Confirm that the noise bar is (G) on the TV monitor in the slow mode.
(7) Repeat steps (3) to (6) in the REV slow (–1/6x) mode.
(8) Repeat steps (1) to (7) in the mode (B2).

Note:
- ***For FWD slow (+1/6x) playback, transmit the code “08” from the Jig RCU to enter the slow playback mode, and transmit the code “D0” for REV slow (–1/6x) mode.***

3.3 Video circuit

3.3.1 Auto picture initial setting

Signal	(A1) (A2) (A3)	• Ext. input • Video: Optional • VHS tape
Mode	(B)	• EE → Auto adjust (SP/LP REC → PB)
Adjustment part	(F)	• Jig RCU : Code “58”
Specified value	(G)	• STOP mode
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Insert the cassette tape (A3).
(2) Set the VCR to the Auto adjust mode by transmitting the code (F) from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed. When the VCR enters the eject mode, repeat steps (1) to (2) again.

3.4 Syscon circuit [HR-J680EU/J780EU]

Note:
- ***When perform this adjustment, remove the Mechanism assembly.***

3.4.1 Timer clock

Signal	(A)	• No signal
Mode	(B)	• EE
Equipment	(C)	• Frequency counter
Measuring point Short point	(D1) (D2) (D3)	• IC3001 pin 61 • IC3001 pin 24 • C3026 + and –
Adjustment part	(F)	• C3025 (TIMER CLOCK)
Specified value	(G)	• 1024.008 ± 0.001 Hz (976.5549 ± 0.0010 µsec)

(1) Connect the frequency counter to the measuring point (D1).
(2) Connect the short wire between the short point (D2) and Vcc (5V).
(3) Short the leads of capacitor (D3) once in order to reset the microprocessor of the SYSCON.
(4) Disconnect the short wire between the short point (D2) and Vcc then connect it again.
(5) Adjust the Adjustment part (F) so that the output frequency becomes the specified value (G).

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

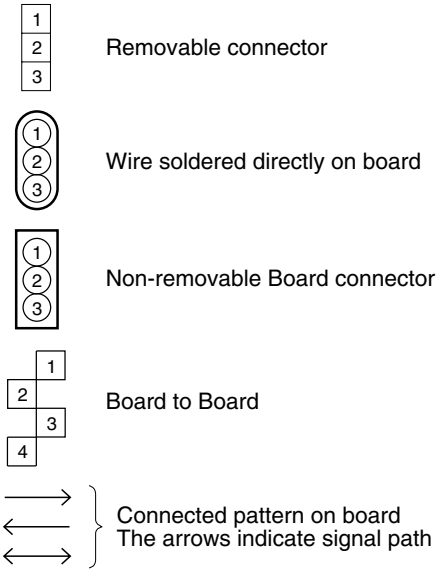
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K or k: kΩ (1000Ω), M: MΩ (1000kΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high

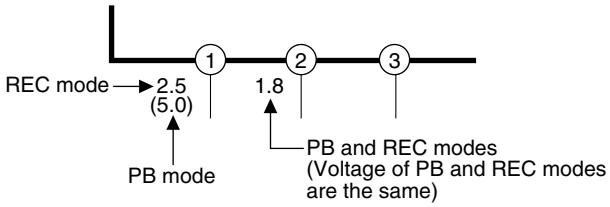
$\overline{\text{AUX}}$ or AUX(L) : Active at low

3. Interpreting Connector indications



4. Voltage measurement

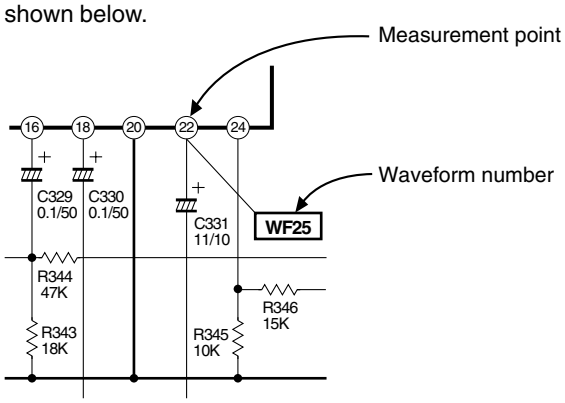
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



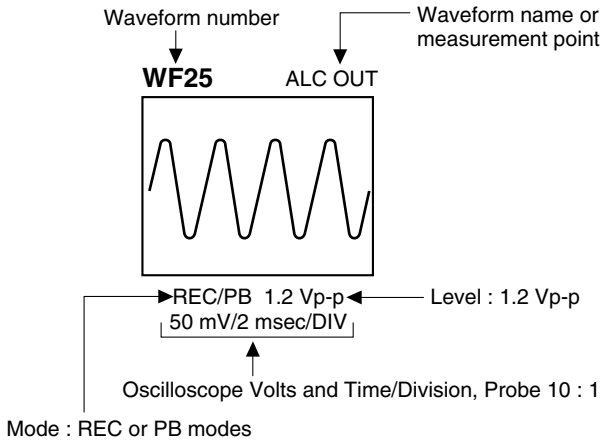
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.



5) Waveform indications



6. Signal path Symbols

The arrows indicate the signal path as follows.

Playback signal path

Playback and recording signal path

Recording signal path
(including E-E signal path)

Capstan servo path

Drum servo path

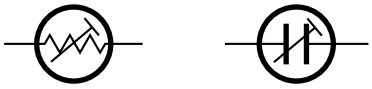
(Example)

R-Y Playback R-Y signal path

Y Recording Y signal path

7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

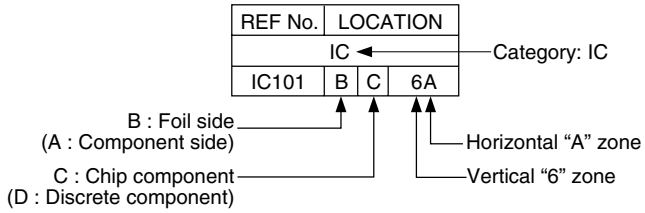
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

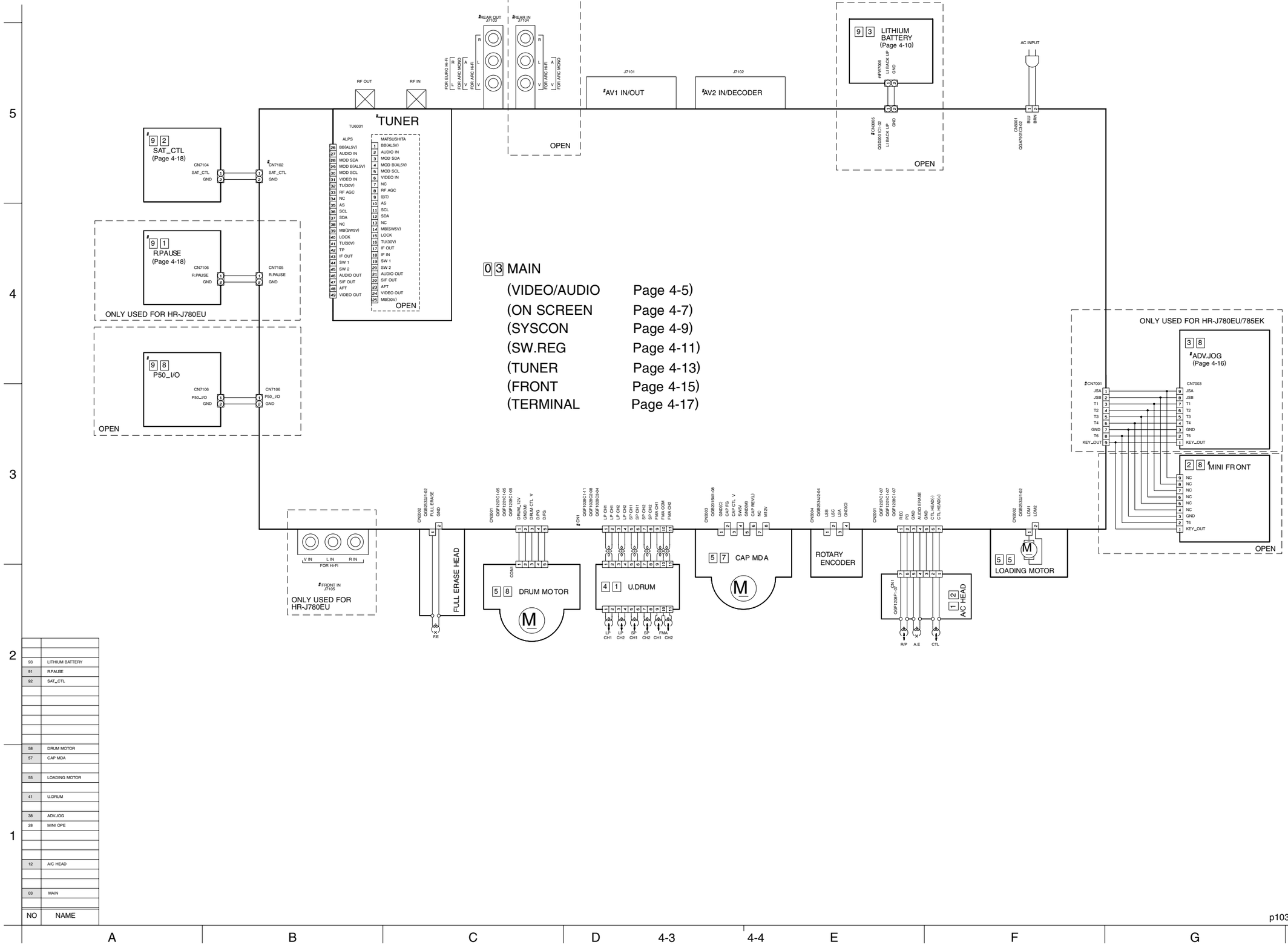
Parts location are indicated by guide scale on the circuit board.



Note:

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS



0 3 MAIN

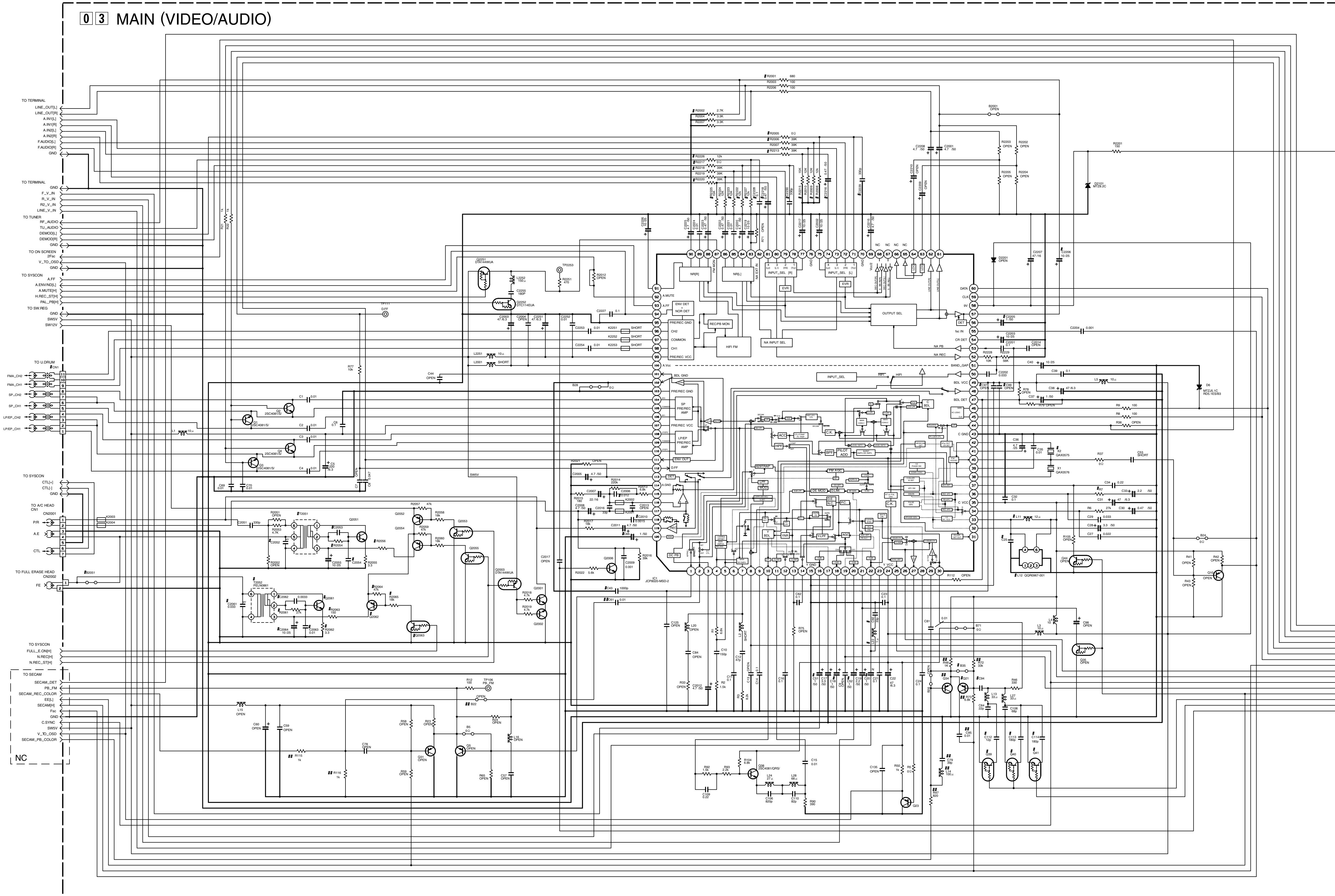
(VIDEO/AUDIO Page 4-5)
(ON SCREEN Page 4-7)
(SYSCON Page 4-9)
(SW.REG Page 4-11)
(TUNER Page 4-13)
(FRONT Page 4-15)
(TERMINAL Page 4-17)

NO	NAME
93	LITHIUM BATTERY
91	R.PAUSE
92	SAT_CTL
58	DRUM MOTOR
57	CAP MDA
55	LOADING MOTOR
41	U.DRUM
38	ADVJOG
28	MINI OPE
12	A/C HEAD
03	MAIN

p10341001a_rev0

4.2 MAIN (VIDEO/AUDIO) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



DIFFERENCE TABLE — AUDIO

○ : Used
× : Not used

	R2005 ,R2008 ,R2217 ,R2222 C2229 ,C2230
WITH CH+	×
W/O CH+	○

	R2213 ,R2215 ,R2220 ,R2225 C2216 ,C2218
W/O RCA R-IN	×
WITH RCA R-IN	○
W/O RCA R-IN	×

	B2051	Q2061 ~ 2063 R2061 ~ 2065 C2061 ~ 2064	R2054	R2056	C2052	C2053	C2054	T2051	T2052
WITH A.DUB	×	○	15k	100	0.033	0.0033	0.01	PELN0860 or QQR1082-001	PELN0861 or QQR1083-001
W/O A.DUB	○	×	12k	82	0.082	0.0047	0.022	PELN0832 or PELN0954 or QQR0002-001	×

	R2006 ,R2009 R2218 ,R2223
WITH RCA F-IN	○
W/O RCA F-IN	×

	R2226 ,R2227 C2228
WITH NICAM	○
W/O NICAM	×

	R2001 ,R2002 C2205 ,C2206
WITH RF CONV.	○
W/O RF CONV.	×

	C2010
WITH LP	○
W/O LP	×

DIFFERENCE TABLE — VIDEO

			C20	C51	C52	C18
WITH CH+		WITH F.IN	NONPOLAR	○	×	×
WITH CH+		W/O F.IN	NONPOLAR	×	×	×
W/O CH+	ARC	WITH F.IN	NONPOLAR	○	○	×
W/O CH+	ARC	W/O F.IN	NONPOLAR	×	○	×
W/O CH+	EURO	WITH F.IN	NONPOLAR	○	×	○
W/O CH+	EURO	W/O F.IN	NONPOLAR	×	×	○

		## SYMBOLS	B35	Q21	C94
SECAM REC/PB	YES	○	×	○	0.01
SECAM REC/PB	NO	×	○	×	SHORT

		Q41,C114
MESECAM REC/PB	YES	○
MESECAM REC/PB	NO	×

		X2 Q39 Q40 C112 C113	R7
NTSC REC	YES	○	820
NTSC REC	NO	×	680

		L11	L12	C92 L22	C43 C97 C99	C25
CE	YES	×	○	○	○	6p
CE	NO	○	×	×	×	4p

NOTES:UNLESS OTHERWISE SPECIFIED.
- ALL NPN TRANSISTOR ARE 2SC4081/QRS/ or 2SD1819A/QRS/ or 2PC4081/R/.
- ALL PNP TRANSISTOR ARE 2SA1576A/QR/ or 2SB1218A/QR/ or 2P A1576/R/.
- ALL NPN DIGIT AL TRANSISTOR ARE DTC144WU A or UN521E or PDTC144WU or RN1309.
- ALL RESISTANCE VALUES ARE IN OHMS.
- ALL INDUCTANCE VALUES ARE IN H.
- ALL CAPACITANCE VALUES ARE IN μF.

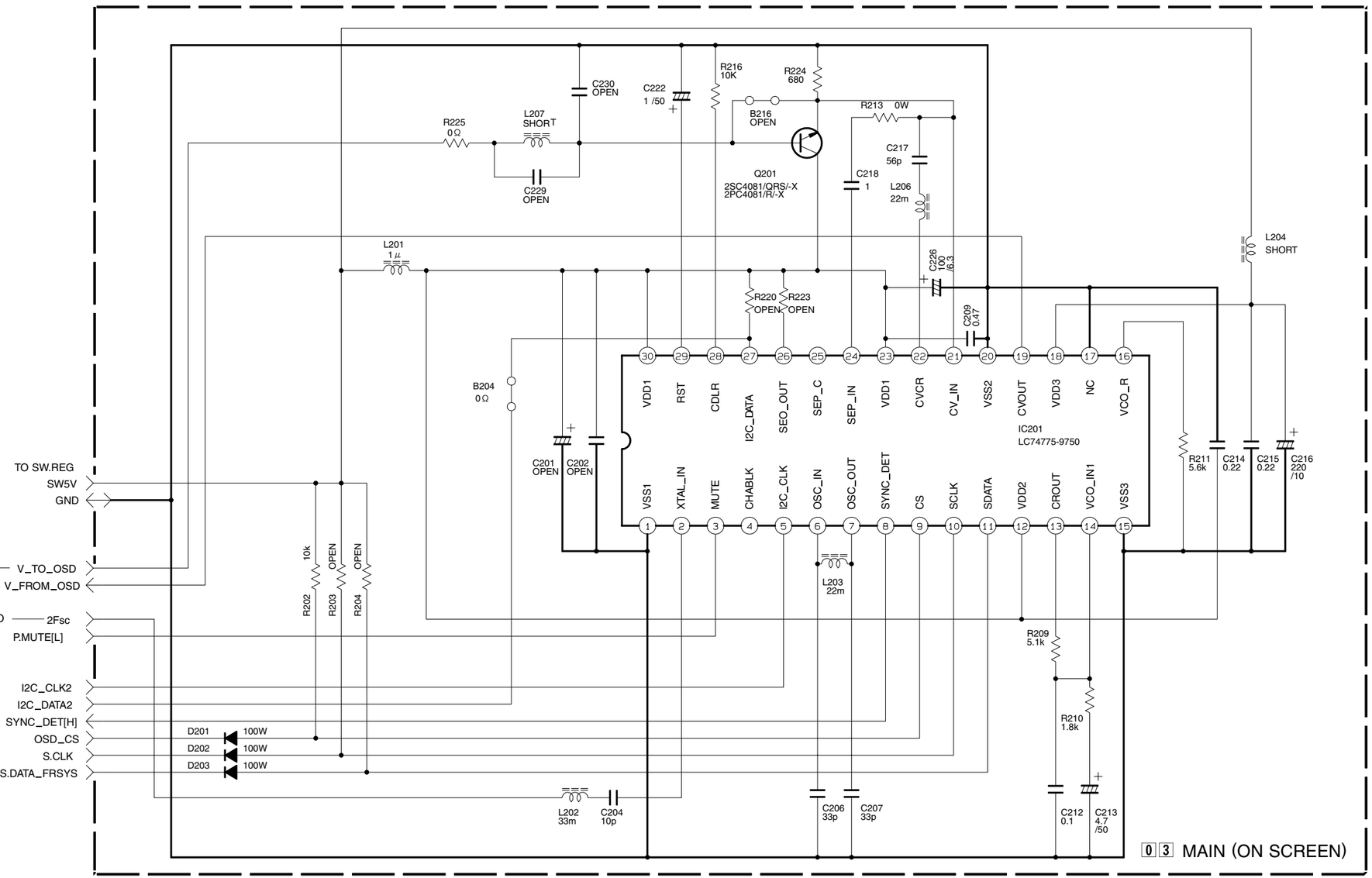
ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

K2001~K2004 = NQR0403-003X

p10344001a_rev0

4.3 MAIN (ON SCREEN) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

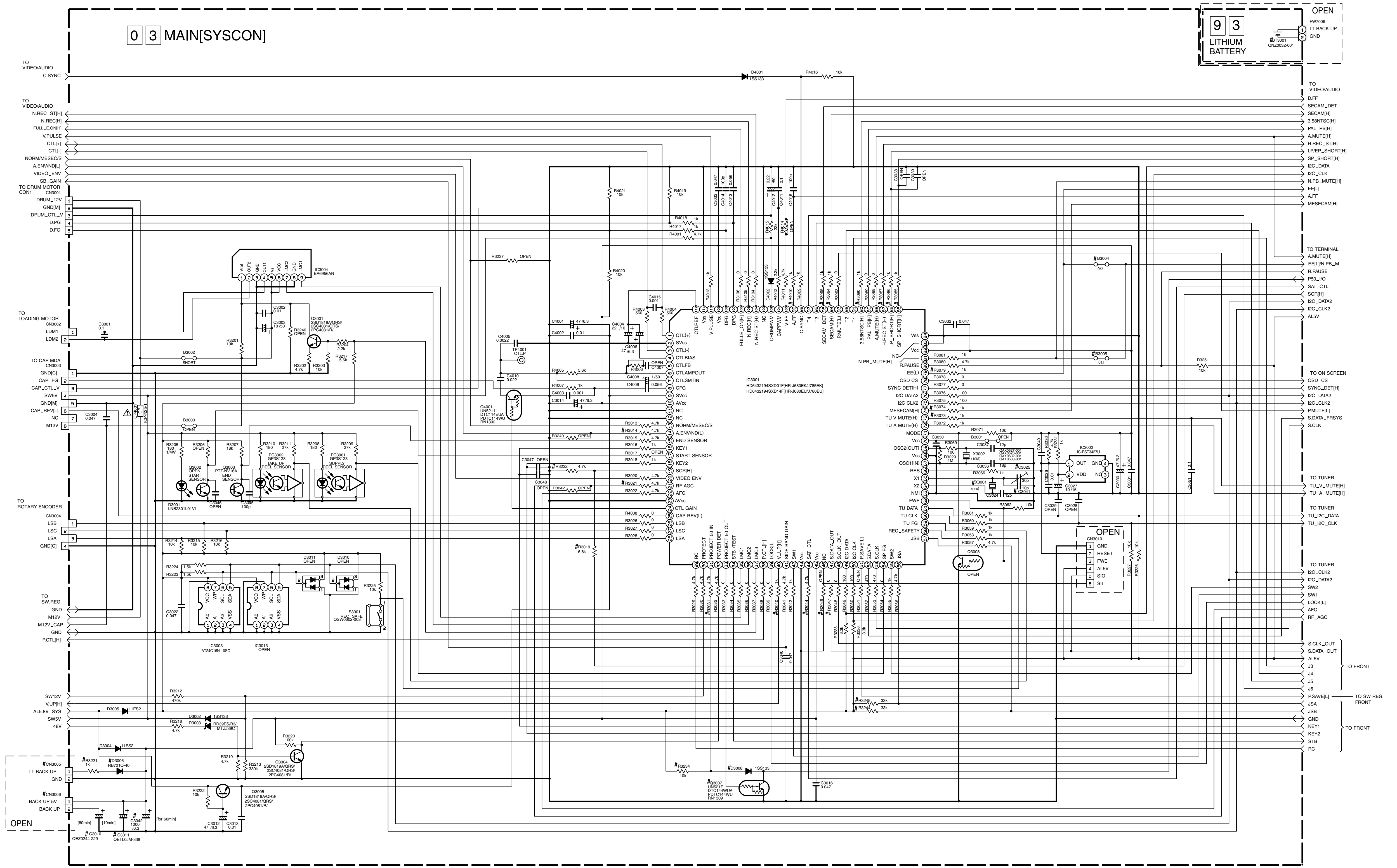
ELECTROLYTIC

CERAMIC

p30086001a_rev0

4.4 MAIN (SYSCON) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



0 3 MAIN[SYSCON]
9 3 LITHIUM BATTERY
OPEN
FW7006
LT BACK UP
GND
#BT3001
QNZ0032-001
TO VIDEO/AUDIO
C.SYNC
N.REC_ST[H]
N.REC[H]
FULL_E.ON[H]
V.PULSE
CTL[+]
CTL[-]
NORM/MESEC/S
A.ENV/ND[L]
VIDEO_ENV
SB_GAIN
TO DRUM MOTOR CON1 CN3001
DRUM_12V
GND[M]
DRUM_CTL_V
D.PG
D.FG
TO LOADING MOTOR CN3002
LDM1
LDM2
TO CAP MDA CN3003
GND[C]
CAP_FG
CAP_CTL_V
SW5V
CAP_REV[L]
NC
M12V
TO ROTARY ENCODER CN3004
LSB
LSC
LSA
TO SW.REG
M12V_CAP
P.CTL[H]
SW12V
V.UP[H]
AL5.8V_SYS
48V
#CN3005
#CN3006
BACK UP 5V
BACK UP
IC3004 BA6956AN
IC3001 HD6432194SXD01F[HR-J680EK/J785EK] HD6432194SXD14F[HR-J680EU/J780EU]
IC3002 IC-PST3427U
IC3003 AT24C16N-10SC
IC3013 OPEN
Q3001 2SD1819A/QRS/ 2SC4081/QRS/ 2PC4081/R/
Q3002 OPEN START SENSOR
Q3003 PTZ-NV16A END SENSOR
PC3002 GP3S123 TAKE UP REEL SENSOR
PC3001 GP3S123 SUPPLY REEL SENSOR
D3001 LNB2301L01VI
Q3004 2SD1819A/QRS/ 2SC4081/QRS/ 2PC4081/R/
Q3005 2SD1819A/QRS/ 2SC4081/QRS/ 2PC4081/R/
Q4001 UN5211 DTC114EUA PDTC114WU RN1302
#Q3007 UN521E DTC144WUA PDTC144WU RN1309
Q3008 OPEN
S3001 REC_SAFE QSW0602-003
CP4001 CP ICP-N25-T
D4001 1SS133
D3002 1SS133
D3003 RD39ES/B3/ MTZJ39C
D3004 11ES2
D3005 11ES2
#D3006 RB721Q-40
#D3008 1SS133
X3002 (10M) QAX0527-001 QAX0528-001 QAX0532-001 QAX0533-001
#X3001 (32k)
#C3010 QEZ0244-229
#C3011 QETL0JM-338
[60min]
[10min]
[for 60min]
OPEN CN3010
GND
RESET
FWE
AL5V
SIO
SII
TO VIDEO/AUDIO
D.FF
SECAM_DET
SECAM[H]
3.58NTSC[H]
PAL_PB[H]
A.MUTE[H]
H.REC_ST[H]
LP/EP_SHORT[H]
SP_SHORT[H]
I2C_DATA
I2C_CLK
N.PB_MUTE[H]
EE[L]
A.FF
MESECAM[H]
TO TERMINAL
A.MUTE[H]
EE[L]/N.PB_M
R.PAUSE
P50_I/O
SAT_CTL
SCR[H]
I2C_DATA2
I2C_CLK2
AL5V
TO ON SCREEN
OSD_CS
SYNC_DET[H]
I2C_DATA2
I2C_CLK2
P.MUTE[L]
S.DATA_FRSYS
S.CLK
TO TUNER
TU_V_MUTE[H]
TU_A_MUTE[H]
TO TUNER
TU_I2C_DATA
TU_I2C_CLK
TO TUNER
I2C_CLK2
I2C_DATA2
SW2
SW1
LOCK[L]
AFC
RF_AGC
S.CLK_OUT
S.DATA_OUT
AL5V
J3
J4
J5
J6
TO FRONT
P.SAVE[L]
TO SW REG, FRONT
JSA
JSB
GND
KEY1
KEY2
STB
RC
TO FRONT

NOTES: UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

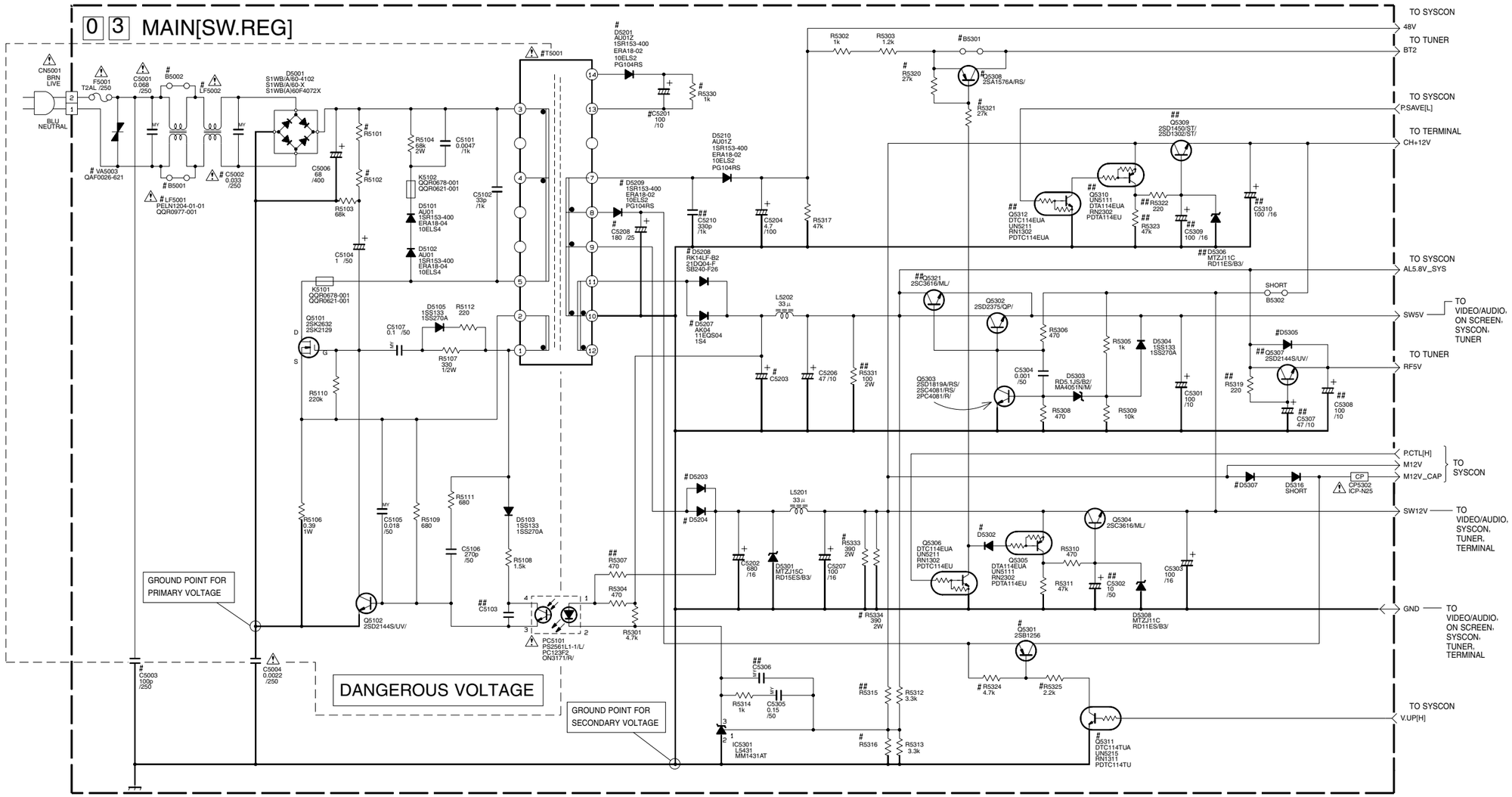
- ELECTROLYTIC
- CERAMIC
- MYLER
- NON POLAR

LAST NO		VACANT NO
R		
C		
D		
Q		
L		

p10342001a_rev0

4.5 MAIN (SW.REG) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



##MARK ELEMENTS ARE NOT MOUNTED

#DIFFERENCE TABLE 1

HIGH SPEED FF/REW		C5208 D5209 Q5301	Q5311 R5324 R5325	D5307	C5201 D5201 R5330	D5203 D5204	T5001
-YES-		YES		1SS2 ERA15-02 1A3G	YES	AU01Z 10ELS2 ERA18-04 1SR153-400 PG104RS	QQS0030-002 QQS0031-002
-NO-	AUTO	NO		SHORT	NO	AU01Z 10ELS2	QQS0030-002 QQS0031-002
	OTHER						QQS0083-001 QQS0084-001

#DIFFERENCE TABLE 2

POWER SAVE	B5301	D5302	D5305	R5101 R5102	R5316	Q5308 R5320 R5321
-YES-	N0	1SS133 1SS270A	AK04 11EQS04 1S4	330k	12k	YES
-NO-	YES	SHORT	1SS2 ERA15-02 1A3G	220k	10k	N0

#DIFFERENCE TABLE 3

	B5001 B5002	C5002	LF5001	LF5002
CE	NO	YES	YES	QQR0978-001 QQR0608-001 QQR0609-001 QQR0610-001
OTHER	YES	NO	NO	QQR0532-001 QQR0533-001 QQR0516-001 QQR0932-001 QQR0816-001

#DIFFERENCE TABLE 4

	D5207	D5208	C5203
HiFi	NO	YES	1200/10
MONO	YES	NO	680/10

#DIFFERENCE TABLE 5

	R5333 R5334
AUTO	YES
OTHER	NO

#DIFFERENCE TABLE 6

	VA5003
JVC	NO
PH	YES

#DIFFERENCE TABLE 7

	C5003
PH/75	YES
OTHER	NO

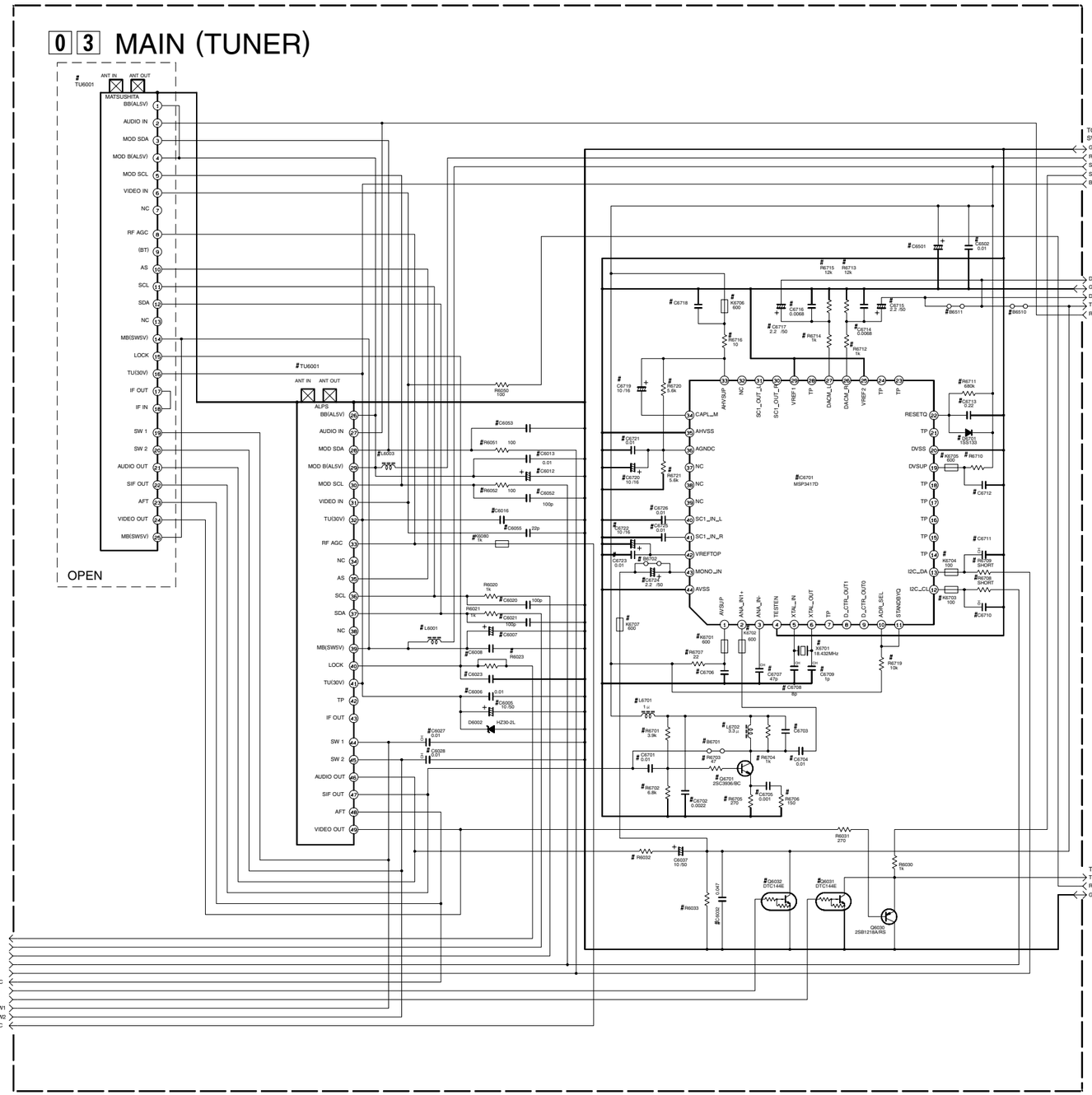
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

ELECTROLYTIC
CERAMIC
MY MYLER
N NON POLAR

p20186001a_rev2

4.6 MAIN (TUNER) SCHEMATIC DIAGRAM

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



DIFFERENCE TABLE

○ : Used
× : Not used

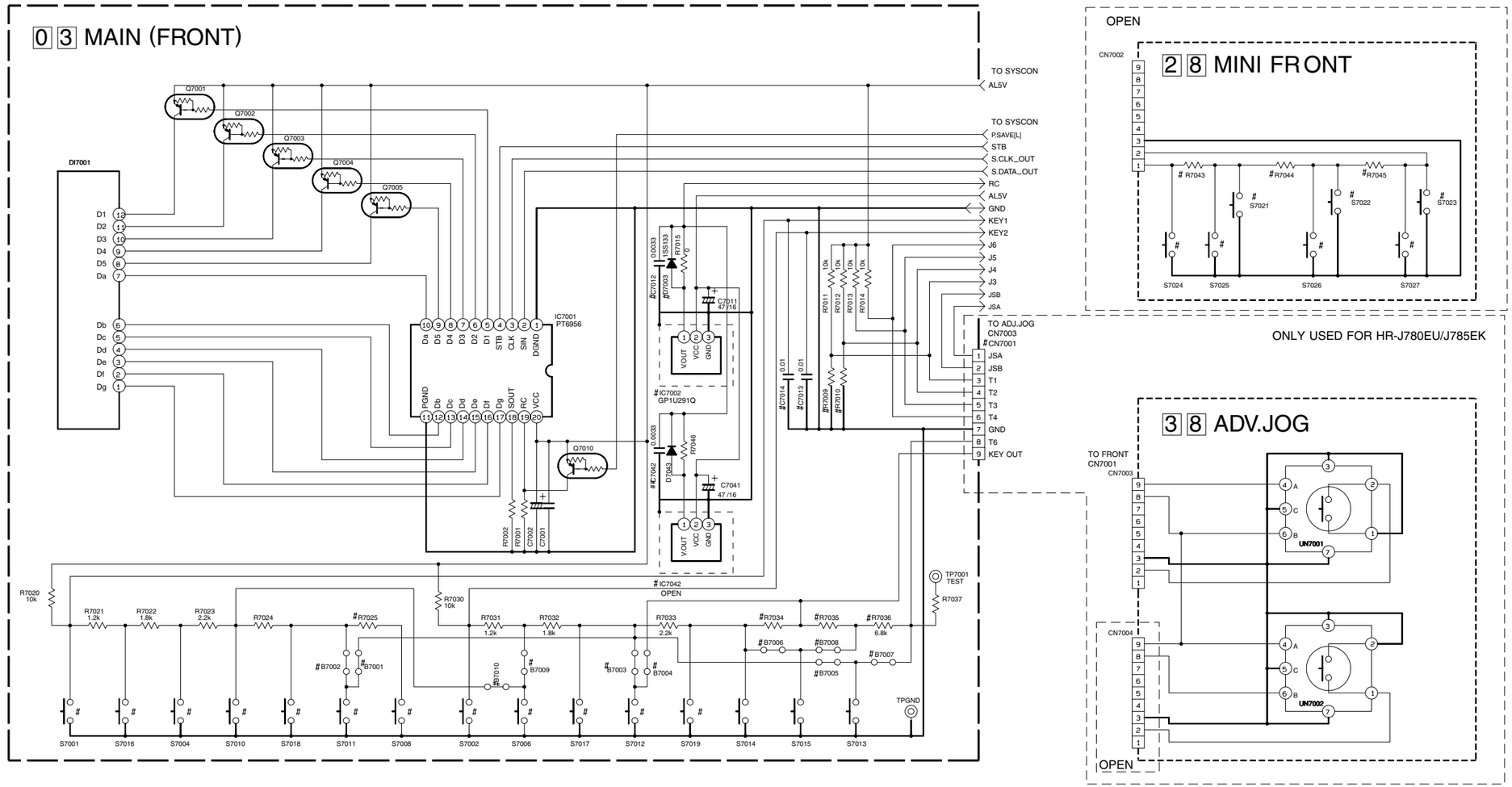
TUNER		EU/EK						FRANCE MS						ASIA 3SYSTEM				ASIA 4SYSTEM	
		HiFi				MONO		HiFi				MONO		HiFi		MONO		HiFi	MONO
		With CH+		Without CH+		(S80 D2)		With CH+		Without CH+									
TUNER UNIT	TU6001	MITSUMI	ALPS	MITSUMI	ALPS	ALPS	MITSUMI	ALPS	LG	ALPS	LG	ALPS	LG	ALPS	MITSUMI	ALPS	MITSUMI	ALPS	MITSUMI
		QAU0212	QAU0208	QAU0212	QAU0208	QAU0209	QAU0212	QAU0208	QAU0210	QAU0211	QAU0212	QAU0211	QAU0210	QAU0211	QAU0212	QAU0208	QAU0212	QAU0208	QAU0236
RF CONVERTER	R6050-R6052.	○	○	○	○	×	○	×	×	×	×	×	×	○	○	○	○	○	○
	L6003	47μ	47μ	47μ	47μ	47μ	SHORT	SHORT	47μ	47μ	47μ	47μ	SHORT	SHORT	47μ	47μ	SHORT	SHORT	47μ	SHORT
	C6012	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	C6013	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	C6052/C6053	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
SW 5V	L6001	1μ	1μ	1μ	1μ	1μ	SHORT	SHORT	1μ	1μ	1μ	1μ	SHORT	SHORT	1μ	1μ	SHORT	SHORT	1μ	SHORT
	C6007,C6008	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
TU(30V)	C6005	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	C6006	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	C6016	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
RF AGC	K6080	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	1kΩ	×	×	×	×	×	×
TUNER PLL	C6020-C6021	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	R6023,C6023	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
CENELEC S2C	C6027	×	×	×	×	×	×	×	×	○	×	○	×	○	×	×	×	×	×	×
	C6028	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
AUDIO OUT	R6032	1.8k	4.7k	1.8k	4.7k	4.7k	1.8k	4.7k	0Ω	0Ω	0Ω	0Ω	0Ω	0Ω	1.8k	4.7k	1.8k	4.7k	0Ω	0Ω
	R6033	2.7k	1.8k	2.7k	1.8k	1.8k	2.7k	1.8k	×	×	×	×	×	×	2.7k	1.8k	2.7k	1.8k	×	×
	C6032	○	○	○	○	○	○	○	×	×	×	×	×	×	○	○	○	○	×	×
AUDIO MUTE	Q6032	○	○	○	○	○	○	○	○	○	○	○	○	○	×	×	×	×	×	×
VIDEO MUTE	Q6031	○	○	○	○	○	○	○	○	○	○	○	○	○	×	×	×	×	×	×
SET HiFi TUNER MONO	B6510-B6511	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	C6501	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	C6502	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
DEMOD																				
PRE AMP	R6701, R6703-R6706, C6702,C6705, Q6701, L6701,L6702	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	○	○
	B6701	○	○	○	○	○	×	×	○	○	○	×	×	○	○	×	×	×	×	×
	R6702	1.8k	1.8k	1.8k	1.8k	1.8k	×	×	1.8k	1.8k	1.8k	1.8k	×	×	1.8k	1.8k	×	×	6.8k	6.8k
	C6701	0Ω	0Ω	0Ω	0Ω	0Ω	×	×	0Ω	0Ω	0Ω	0Ω	×	×	0Ω	0Ω	×	×	0.01	0.01
	C6703	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	33p	33p
	C6704	○	○	○	○	○	×	×	○	○	○	○	×	×	○	○	×	×	○	×
MONO IN	B6702	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	C6724,K6707	×	×	×	×	×	×	×	○	○	○	○	×	×	×	×	×	×	×	×
	R6707-R6712, R6714-R6716, R6719-R6721, C6707-C6709, C6713-C6717, C6719-C6721, C6723,K6701, K6703-K6706, IC6701	○	○	○	○	○	×	×	○	○	○	○	×	×	○	○	×	×	○	×
	C6706,C6710, C6711,C6712, C6718,C6723, C6725,C6726	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
AUDIO LO AD	R6713,R6715	○	○	×	×	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.
ELECTROLYTIC
CERAMIC
MY MYLER
NP NON POLAR

p1034001a_rev0

4.7 MAIN (FRONT) AND ADJ.JOG SCHEMATIC DIAGRAMS

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



DIFFERENCE TABLE

○ : Used
× : Not used

BRAND	TOOL	WORKING NUMBER	S7001	S7002	S7004	S7006	S7008	S7010	S7011	S7012	S7013	S7014	S7015	S7016	S7017	S7018	S7019	S7021 S7023	S7024 S7027	J/S	R7025	R7034	R7035 R7036	R7043 R7045	B7001	B7002	B7003	B7004	B7005 B7006	B7007	B7008	B7009	B7010
JVC	400HA	D1+,D15	STAND-BY	A.DUB	REC	PAUSE	STOP/EJECT	PLAY	—	E.PROG.	—	—	—	SAT.CTL.	—	—	—	—	—	adv	○	○	○	×	×	×	○	×	×	×	×	○	×
	400H	D1,D11,D12	**POWER**	**CH -**	**REC**	**PAUSE**	**STOP/EJECT**	**REC LINK**	—	**PLAY**	—	**REW**	**FF**	**CH +**	—	—	—	—	—	×	**O**	**O**	**O**	×	×	×	**O**	×	×	×	**O**	**O**	×
			STAND-BY	CH -	REC	PAUSE	STOP/EJECT	SAT.CTL.	—	PLAY	—	REW	FF	CH +	—	—	—	—	—	×	○	○	○	×	×	×	○	×	×	×	○	○	×
	360E	A1,A11,C1,D0+,D1-	STAND-BY	TIMER	CH -	CH +	—	DISPLAY	REC	—	PAUSE	—	STOP/EJECT	SAT.CTL.	—	—	—	○	—	×	×	×	×	○	×	○	×	×	○	×	×	○	×

NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

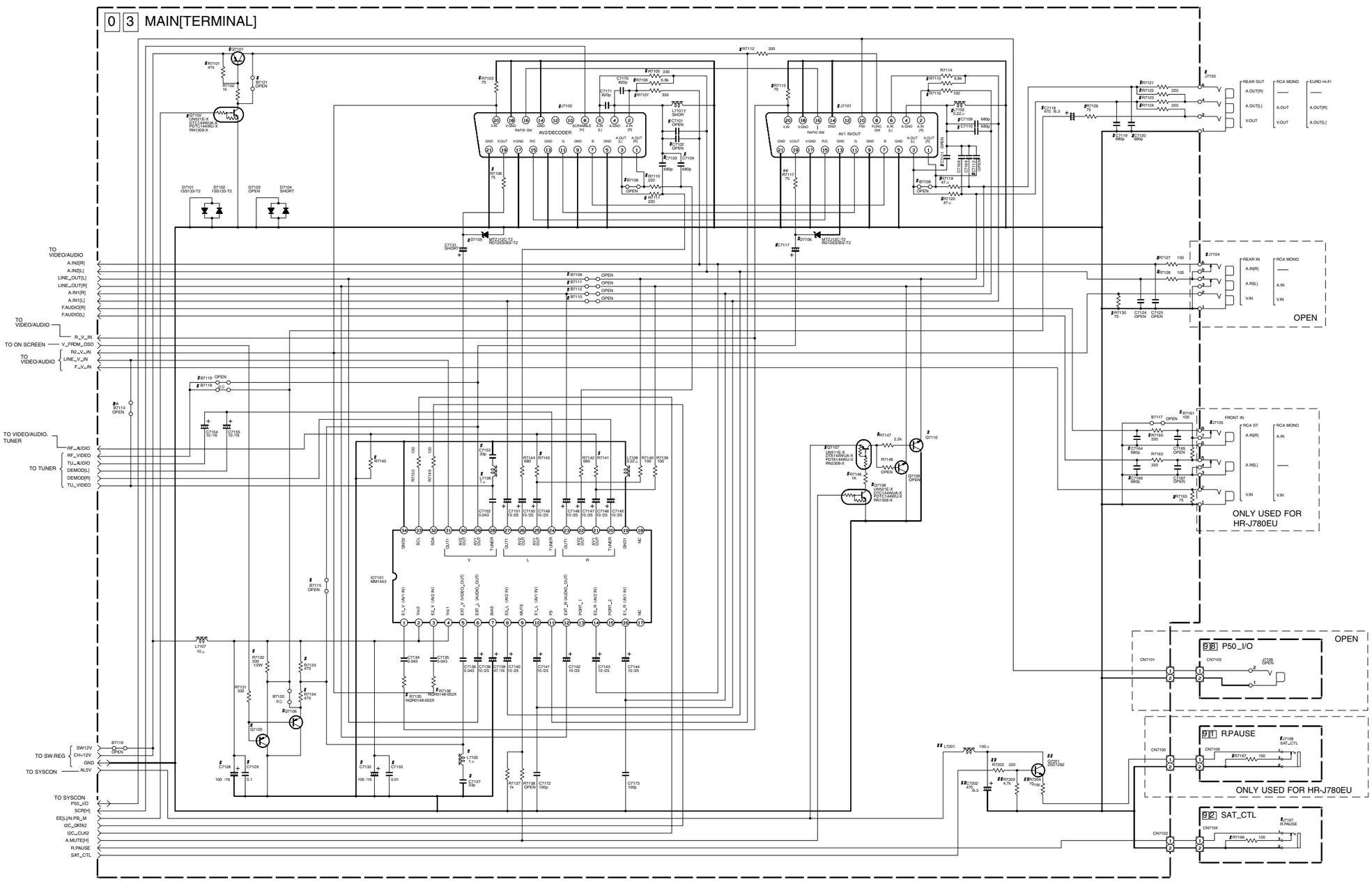
ELECTROLYTIC
CERAMIC
MYLER
NON POLAR

LAST NO	VACANT NO
R	
C	
D	
Q	
L	

p20201001a_rev0

4.8 MAIN (TERMINAL), SAT CTL AND R.PAUSE SCHEMATIC DIAGRAMS

Note : The Parts Number, value and rated voltage etc. in the Schematic Diagram are for references only. When replacing the parts, refer to the Parts List.



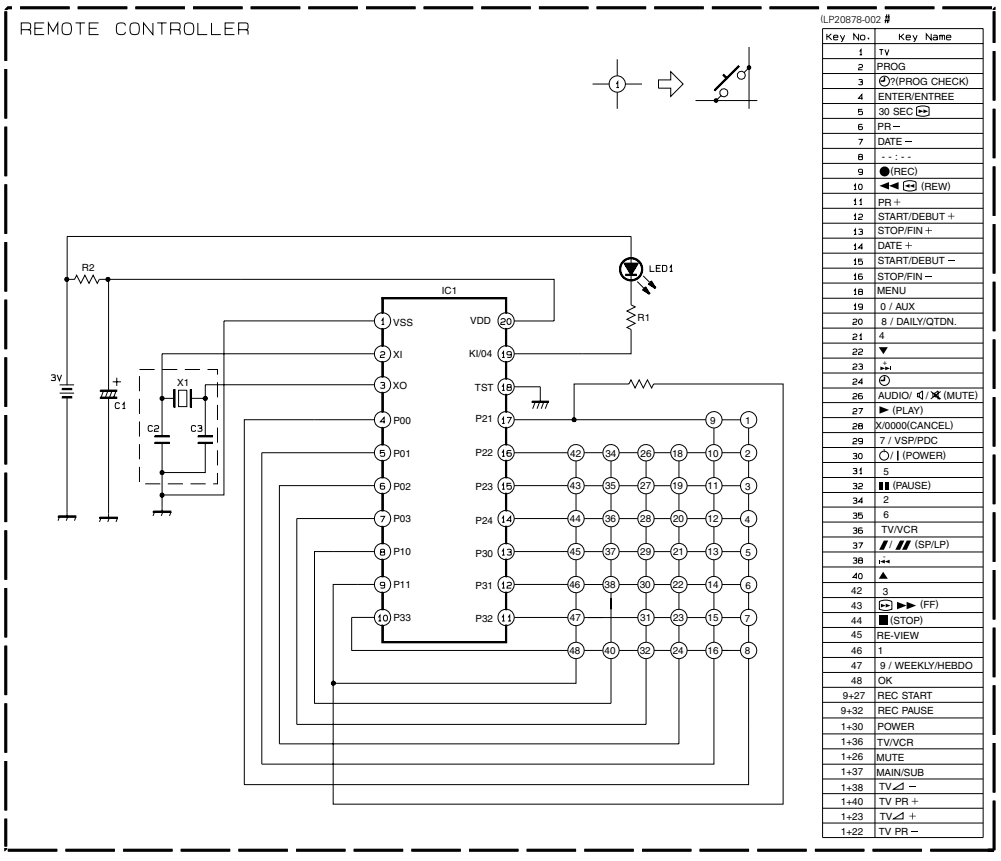
NOTES:UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS.
ALL INDUCTANCE VALUES ARE IN H.
ALL CAPACITANCE VALUES ARE IN μF.

ELECTROLYTIC
CERAMIC
MY MYLER
PE NON POLAR

p10343001a_rev0

4.9 REMOTE CONTROLLER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

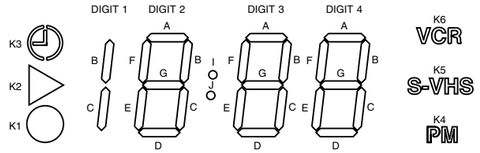


(LP20878-002 #

Key No.	Key Name
1	TV
2	PROG
3	?(PROG CHECK)
4	ENTER/ENTREE
5	30 SEC
6	PR –
7	DATE –
8	- - : - -
9	●(REC)
10	◄◄ (REW)
11	PR +
12	START/DEBUT +
13	STOP/FIN +
14	DATE +
15	START/DEBUT –
16	STOP/FIN –
18	MENU
19	0 / AUX
20	8 / DAILY/QTDN.
21	4
22	▼
23	
24	
26	AUDIO/ / (MUTE)
27	► (PLAY)
28	X/0000(CANCEL)
29	7 / VSP/PDC
30	/ (POWER)
31	5
32	▮▮ (PAUSE)
34	2
35	6
36	TV/VCR
37	/ (SP/LP)
38	
40	▲
42	3
43	►► (FF)
44	■ (STOP)
45	RE-VIEW
46	1
47	9 / WEEKLY/HEBDO
48	OK
9+27	REC START
9+32	REC PAUSE
1+30	POWER
1+36	TV/VCR
1+26	MUTE
1+37	MAIN/SUB
1+38	TV –
1+40	TV PR +
1+23	TV +
1+22	TV PR –

4.11 FDP GRID ASSIGNMENT AND ANODE CONNECTION

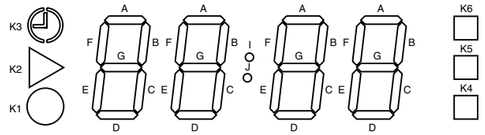
GRID ASSIGNMENT



ANODE CONNECTION

No.	CONNECTION
1	CATHODE 2G, 3G, 4G, I, J
2	CATHODE 2F, 3F, 4F, K6
3	CATHODE 2E, 3E,4E, K1
4	CATHODE 2D, 3D, 4D, K4
5	CATHODE 1C, 2C, 3C, 4C, K5
6	CATHODE 1B, 2B, 3B, 4B, K2
7	CATHODE 2A, 3A, 4A, K3
8	COMMON ANODE K3, K2, K5, K4, K1, K6, I, J
9	COMMON ANODE DIGIT4
10	COMMON ANODE DIGIT3
11	COMMON ANODE DIGIT2
12	COMMON ANODE DIGIT1

GRID ASSIGNMENT



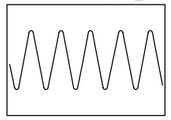
ANODE CONNECTION

No.	CONNECTION
1	CATHODE 1G, 2G, 3G, 4G, I, J
2	CATHODE 1F, 2F, 3F, 4F, K6
3	CATHODE 1E, 2E, 3E,4E, K1
4	CATHODE 1D, 2D, 3D, 4D, K4
5	CATHODE 1C, 2C, 3C, 4C, K5
6	CATHODE 1B, 2B, 3B, 4B, K2
7	CATHODE 1A, 2A, 3A, 4A, K3
8	COMMON ANODE K3, K2, K5, K4, K1, K6, I, J
9	COMMON ANODE DIGIT4
10	COMMON ANODE DIGIT3
11	COMMON ANODE DIGIT2
12	COMMON ANODE DIGIT1

4.12 WAVEFORMS

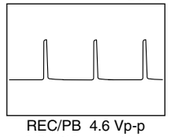
< SYSCON >

WF1 CN3003-2 CAP_FG



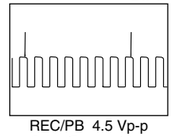
REC/PB 2.2 Vp-p
50 mV/0.5 msec/DIV

WF2 CN3001-4 D.PG



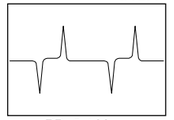
REC/PB 4.6 Vp-p
0.2 V/10 msec/DIV

WF3 CN3001-5 D.FG



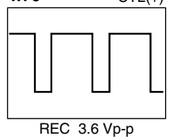
REC/PB 4.5 Vp-p
0.1 V/5 msec/DIV

WF4 TP4001 CTL. P



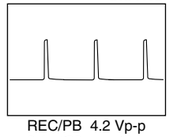
PB 2.4 Vp-p
50 mV/10 msec/DIV

WF5 IC3001-1 CTL(+)



REC 3.6 Vp-p
0.1 V/10 msec/DIV

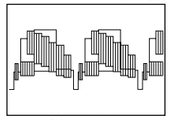
WF6 IC3001-98 C.SYNC



REC/PB 4.2 Vp-p
0.1 V/20 µsec/DIV

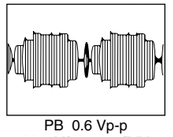
< VIDEO >

WF1 IC1-27



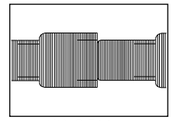
REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

WF2 IC1-30



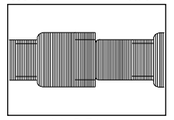
PB 0.6 Vp-p
20 mV/20 µsec/DIV

WF3 TP106 PB.FM



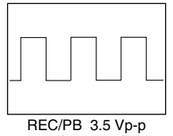
PB 0.5 Vp-p
20 mV/2 msec/DIV

WF4 IC1-1



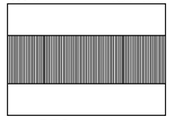
PB 0.5 Vp-p
20 mV/5 msec/DIV

WF5 TP111 D.FF



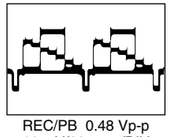
REC/PB 3.5 Vp-p
0.1 V/10 msec/DIV

WF6 IC1-105



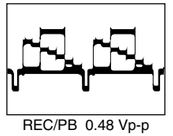
REC 1.4 Vp-p
50 mV/1 msec/DIV

WF7 IC1-13



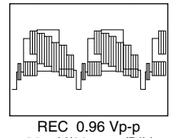
REC/PB 0.48 Vp-p
10 mV/20 µsec/DIV

WF8 IC1-11



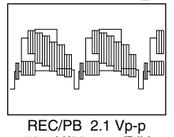
REC/PB 0.48 Vp-p
10 mV/20 µsec/DIV

WF9 IC1-22



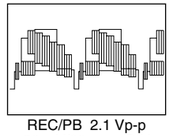
REC 0.96 Vp-p
20 mV/20 µsec/DIV

WF10 IC201-21 CV_IN



REC/PB 2.1 Vp-p
50 mV/20 µsec/DIV

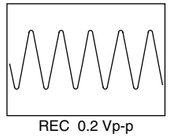
WF11 IC201-19 CVOUT



REC/PB 2.1 Vp-p
50 mV/20 µsec/DIV

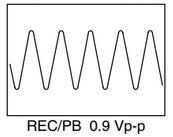
< AUDIO >

WF1 IC1-80



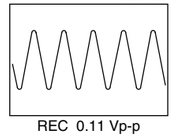
REC 0.2 Vp-p
5 mV/0.5 msec/DIV

WF2 IC1-62



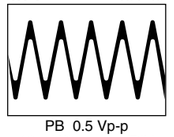
REC/PB 0.9 Vp-p
20 mV/0.5 msec/DIV

WF3 IC1-52



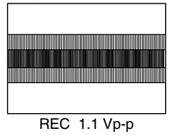
REC 0.11 Vp-p
2 mV/0.5 msec/DIV

WF4 IC1-48



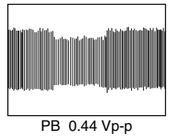
PB 0.5 Vp-p
10 mV/0.5 msec/DIV

WF5 IC1-97



REC 1.1 Vp-p
50 mV/0.5 msec/DIV

WF6 TP2253 A.PB.FM



PB 0.44 Vp-p
20 mV/5 msec/DIV

4.13 VOLTAGE CHARTS

<MAIN>

MODE PIN NO.	REC	PLAY
IC1		
1	1.7	2.1
2	2.9	2.9
3	2.6	2.6
4	1.9	1.4
5	1.9	1.4
6	2.4	2.1
7	1.5	0.7
8	0	0
9	2.6	2.9
10	2.4	2.4
11	3.1	3.1
12	2.8	2.6
13	3.1	3.1
14	2.3	2.3
15	0	0
16	2.8	2.8
17	1.5	1.5
18	2.8	2.8
19	0	2.6
20	2.8	2.8
21	2.0	1.4
22	2.8	2.8
23	2.8	2.8
24	5.1	5.1
25	0.4	2.8
26	0	0
27	2.3	2.3
28	2.3	2.3
29	1.9	1.9
30	2.1	2.1
31	0	0
32	2.5	2.5
33	5.0	5.0
34	2.7	2.3
35	5.4	5.4
36	2.6	2.6
37	2.3	2.3
38	-	-
39	1.2	1.2
40	-	-
41	2.6	2.6
42	-	-
43	0	0
44	2.2	2.2
45	4.8	4.8
46	4.7	4.7
47	2.9	2.9
48	2.6	2.6
49	5.1	5.1
50	2.5	2.5
51	2.8	2.8
52	2.4	2.4
53	2.3	2.3
54	2.4	2.4
55	2.2	2.2
56	0.4	0.4
57	2.4	2.4
58	8.2	8.2
59	4.8	4.8
60	4.7	4.7
61	4.2	4.2
62	4.2	4.2
63	2.4	2.4
64	2.3	2.3
65	1.8	1.8
66	3.1	3.1
67	4.2	4.2
68	4.2	4.2
69	2.4	2.4
70	0	0
71	3.4	3.4
72	3.4	3.4
73	0.2	0.2
74	2.4	2.4
75	2.8	2.8
76	0	0
77	2.8	2.8
78	3.4	3.4
79	3.4	3.4
80	0.2	0.2
81	2.4	2.4
82	0.8	0
83	0	0
84	2.4	2.4
85	2.4	0
86	2.3	2.3
87	1.7	1.9
88	2.3	2.3
89	2.4	2.4
90	2.4	2.4
91	0.1	0.1
92	0	0
93	0	2.2
94	0	1.8
95	0	0
96	2.5	2.5
97	2.8	2.5
98	2.5	2.5
99	5.4	5.4
100	5.0	0

MODE PIN NO.	REC	PLAY
101	0	0
102	0	0
103	0	0
104	2.5	2.5
105	2.4	2.4
106	2.4	2.4
107	5.4	5.4
108	0	0
109	0	0
110	5.0	0
111	0	3.4
112	2.5	2.5
113	0.5	0.5
114	0	0
115	2.6	2.6
116	2.5	2.5
117	2.5	2.5
118	0	0
119	2.5	2.5
120	4.7	4.9
IC201		
1	0	0
2	2.6	2.8
3	4.9	4.9
4	0	0
5	4.5	4.5
6	2.5	2.5
7	2.5	2.7
8	5.4	5.4
9	3.1	3.1
10	4.5	4.5
11	0.7	0.7
12	5.4	5.4
13	2.8	3.0
14	2.8	3.0
15	0	0
16	1.2	1.2
17	0	0
18	5.4	5.4
19	2.3	2.3
20	0	0
21	2.3	2.3
22	0.3	0.5
23	5.4	5.4
24	2.9	3.2
25	2.5	2.7
26	5.4	5.4
27	4.6	4.6
28	3.6	4.0
29	5.4	5.4
30	5.4	5.4
IC3001		
1	2.7	2.4
2	0	0
3	0	2.4
4	2.4	2.4
5	0	0
6	2.4	2.4
7	2.4	0
8	2.4	2.4
9	4.9	4.9
10	4.9	4.9
11	0	0
12	0	0
13	0	0
14	0	1.8
15	4.7	4.7
16	4.9	4.9
17	0	0.3
18	4.9	4.9
19	0	0
20	0	3.4
21	4.0	4.3
22	4.6	4.3
23	0	0
24	4.8	4.8
25	0	4.9
26	4.9	4.9
27	4.9	4.9
28	0	0
29	4.9	4.9
30	4.2	4.2
31	4.9	4.9
32	0	0
33	0	0
34	4.8	4.8
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0
41	0	2.7
42	0	0
43	0	0
44	0	0
45	4.9	4.9
46	0	0
47	0	0
48	4.9	4.9
49	4.7	4.7

MODE PIN NO.	REC	PLAY
50	4.8	4.8
51	4.9	4.9
52	0.8	0.8
53	4.5	4.5
54	-	-
55	0	0
56	0	0
57	0	0
58	4.9	4.9
59	-	-
60	0	4.9
61	0	4.9
62	0	0
63	0	0
64	-	-
65	-	-
66	-	-
67	-	-
68	0	0
69	-	-
70	4.9	4.9
71	4.9	4.9
72	4.9	4.9
73	4.9	4.9
74	0	0
75	4.5	4.5
76	4.6	4.6
77	5.4	5.4
78	3.1	3.1
79	0	4.9
80	0	0
81	0	0
82	4.9	4.9
83	0	0
84	0	0
85	0	0
86	4.6	4.6
87	4.9	4.9
88	0	0
89	4.9	4.9
90	0	0
91	0	0
92	0	0
93	4.9	4.9
94	0	0
95	0	0
96	0	0
97	0	0
98	0.3	0.3
99	0	2.5
100	2.5	2.5
101	2.5	2.7
102	1.4	1.4
103	0	0
104	4.9	0
105	4.9	0
106	4.9	0
107	0.1	0.1
108	1.5	1.5
109	4.9	4.9
110	0	0
111	0	0
112	2.4	2.4
IC3002		
1	4.9	4.9
2	4.9	4.9
3	0	0
4	0	0
IC3003		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.6	4.6
6	4.5	4.5
7	0	0
8	4.9	4.9
IC3004		
1	11.7	11.7
2	0.2	0.2
3	0	0
4	0.2	0.2
5	11.7	11.7
6	11.7	11.7
7	0	0
8	0	0
9	0	0
IC5301		
1	2.5	2.5
2	0	0
3	4.4	4.4
IC6701		
1	4.3	4.6
2	1.5	1.5
3	1.5	1.5
4	0	0
5	-	-
6	-	-
7	0.1	0.1
8	0	0
9	0	0

MODE PIN NO.	REC	PLAY
10	3.6	3.9
11	3.6	3.9
12	4.5	4.5
13	4.5	4.5
14	2.5	2.7
15	2.5	2.7
16	0	0
17	0.1	0.1
18	0.1	0.1
19	4.9	5.3
20	0	0
21	0.1	0.1
22	4.7	5.1
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	2.5	2.5
31	2.5	2.5
32	0	0
33	4.9	5.3
34	4.0	4.4
35	0	0
36	2.5	2.5
37	0	0
38	0	0
39	0	0
40	2.5	2.5
41	2.5	2.5
42	2.6	2.6
43	2.5	2.5
44	0	0
IC7001		
1	0	0
2	0	0
3	4.9	4.9
4	4.9	4.9
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	0	0
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-
17	-	-
18	1.0	4.9
19	2.2	2.2
20	4.9	4.9
IC7002		
1	4.9	4.9
2	4.9	4.9
3	0	0
IC7101		
1	3.0	3.0
2	10.4	10.4
3	2.7	2.7
4	10.4	10.4
5	3.1	3.1
6	4.9	4.9
7	4.9	4.9
8	4.8	4.8
9	0	0
10	4.8	4.8
11	9.8	9.8
12	4.8	4.8
13	0	0
14	4.8	4.8
15	0	0
16	4.9	4.9
17	0	0
18	0	0
19	0	0
20	4.8	4.8
21	4.9	4.9
22	4.9	4.9
23	4.8	4.8
24	4.8	4.8
25	4.9	4.9
26	4.9	4.9
27	4.8	4.8
28	2.7	2.7
29	2.2	2.2
30	2.0	2.0
31	1.7	1.7
32	4.6	4.6
33	4.5	4.5
34	0	0
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.4	2.4

MODE PIN NO.	REC	PLAY
6	2.4	2.4
7	2.4	2.4
8	2.4	2.4
9	2.8	2.5
10	2.8	2.5
11	2.8	2.5
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.2	2.4
7	2.4	2.4
CN2002		
1	0	0
2	0	0
CN3001		
1	11.7	11.7
2	0	0
3	1.4	1.4
4	0.1	0.1
5	1.5	1.5
CN3002		
1	0.2	0.2
2	0.2	0.2
CN3003		
1	0	0
2	2.5	2.7
3	2.5	2.5
4	5.4	5.4
5	0	0
6	4.9	4.9
7	-	-
8	11.7	11.7
CN3004		
1	4.9	4.9
2	4.9	4.9
3	0	0
4	0	0
CN7001	-	-
CN7102		
1	0	0
2	0	0
CN7105	-	-

<ADV.JOG> [HR-J780EU/J785EK]

MODE PIN NO.	REC	PLAY
CN7003	-	-

<SAT CTL>

MODE PIN NO.	REC	PLAY
CN7104		
1	0	0
2	0	0

<R.PAUSE> [HR-J780EU]

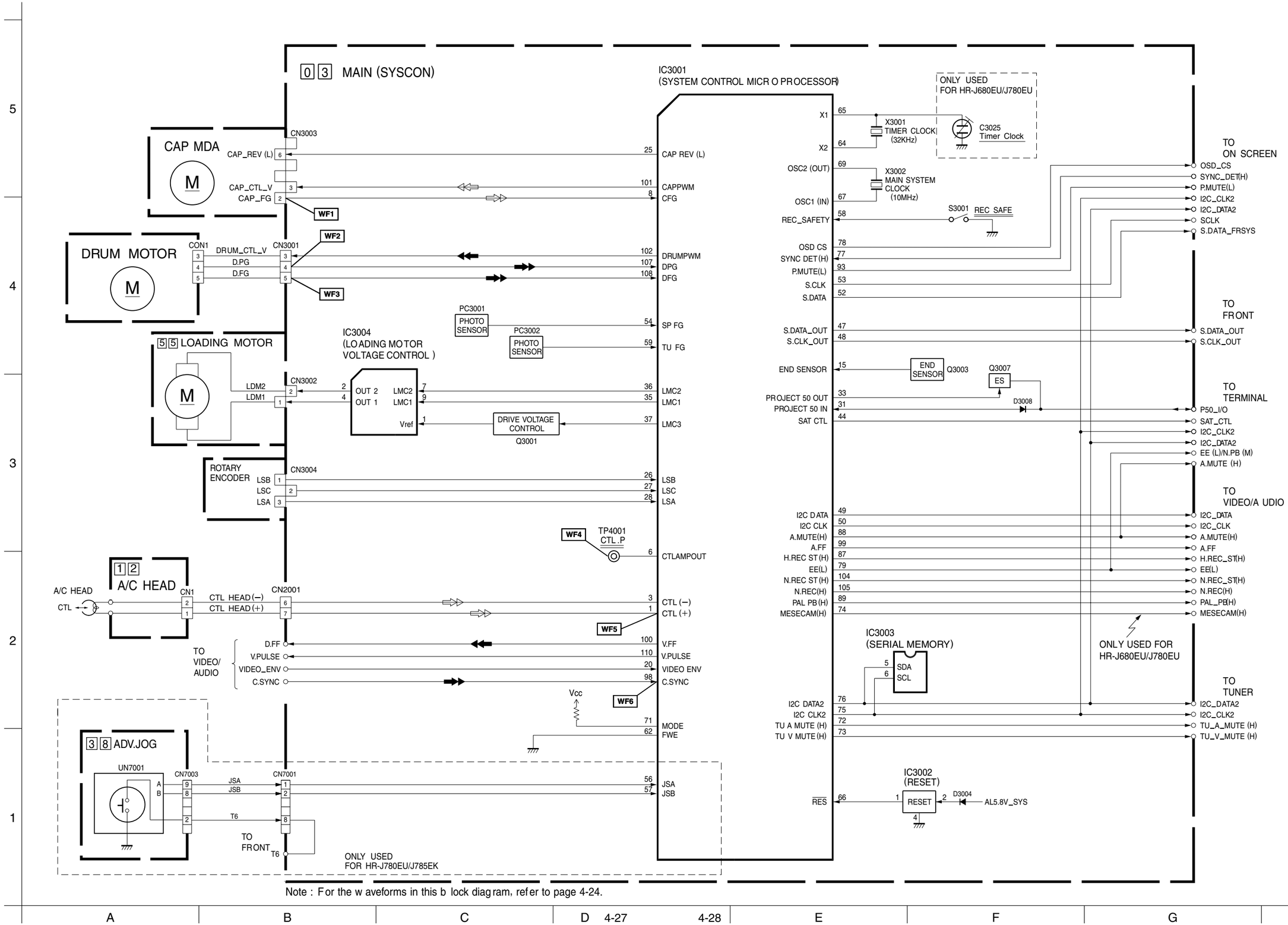
MODE PIN NO.	REC	PLAY
CN7106	-	-

4.14 CPU PIN FUNCTION

<SYSCON IC3001>

PIN NO.	LABEL	IN/OUT	FUNCTION
1	CTL(+)	IN/OUT	CTL(+)SIGNAL
2	SVSS	-	GND
3	CTL(-)	IN/OUT	CTL(-)SIGNAL
4	CTLBIAS	-	CTL BIAS VOLTAGE
5	CTLFB	IN	CTL PULSE FEEDBACK [HR-J780EU]
6	CTLAMPOUT	OUT	CTL PULSE OUTPUT
7	CTLSMTIN	IN	CTL PULSE INPUT
8	CFG	IN	CAPSTAN FG PULSE INPUT
9	SVCC	-	SYSTEM POWER
10	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
11	NC	-	NC
12	NC	-	NC
13	NORM/MESEC/S	IN	NORMAL MODE:L/MESECAM MODE:M/NC
14	A.ENV/ND(L)	IN	AUDIO PB FM ENV.INPUT/NON HiFi MODE:L
15	END SENSOR	IN	END SENSOR
16	KEY1	IN	OPERATION CONTROL SIGNAL
17	START SENSOR	-	NC
18	KEY2	IN	OPERATION CONTROL SIGNAL
19	SCR(H)	IN	SCRAMBLE CONTROL INPUT (SCRAMBLE:H)
20	VIDEO ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
21	RF AGC	IN	CHANGES IN ATS+IC OUTPUT AS CAUSED BY CHANGES IN RECEIVER SENSITIVITY WHEN THE SAME CHANNEL IS RECEIVED MORE THAN ONCE ARE INPUT.
22	AFC	IN	TUNING LOCK
23	AVSS	-	GND FOR ANALOG CIRCUIT
24	CTL GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
25	CAP REV(L)	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L)
26	LSB	IN	MECHANISM MODE DETECT(B)
27	LSC	IN	MECHANISM MODE DETECT(C)
28	LSA	IN	MECHANISM MODE DETECT(A)
29	RC	IN	REMOTE CONTROL DATA INPUT
30	PROTECT	IN	DETECTION SIGNAL FOR SW POWER SUPPLY
31	PROJECT 50 IN	IN	CONTROL SIGNAL FOR TV LINK
32	POWER DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
33	PROJECT 50 OUT	OUT	CONTROL SIGNAL FOR TV LINK
34	STB/TEST	OUT	STROBE SIGNAL (FOR FDP DRIVER)
35	LMC1	OUT	LOADING MOTOR DRIVE(1)
36	LMC2	OUT	LOADING MOTOR DRIVE(2)
37	LMC3	OUT	LOADING MOTOR DRIVE(3)
38	P.CTL(H)	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
39	LOCK(L)	IN	TUNING PLL LOCK DETECT: L
40	V_UP(H)	-	NC
41	SIDE BAND GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
42	SW1	OUT	TUNER SYSTEM "L" MODEL: H
43	VSS	-	GND
44	SAT_CTL	OUT	REMOTE CONTROL OUTPUT FOR SATELLITE RECEIVER
45	VCC	-	SYSTEM POWER
46	NC	-	NC
47	S.DATA_OUT	OUT	SERIAL DATA INPUT FOR THE FDP DRIVER
48	S.CLK_OUT	OUT	SERIAL DATA TRANSMISSION CLOCK FOR THE FDP DRIVER
49	I2C DATA	IN/OUT	SERIAL DATA TRANSFER INPUT/OUTPUT
50	I2C CLK	OUT	SERIAL DATA TRANSFER CLOCK
51	P.SAVE(L)	-	NC
52	S.DATA	OUT	SERIAL DATA TRANSFER OUTPUT TO THE ON-SCREEN IC
53	S.CLK	OUT	SERIAL DATA TRANSMISSION CLOCK FOR THE ON-SCREEN IC
54	SP FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
55	SW2	OUT	TUNER SYSTEM "L" MODE:L
56	JSA	IN	INPUT FOR JOG SHUTTLE [HR-J780EU/J785EK]
57	JSB	IN	INPUT FOR JOG SHUTTLE [HR-J780EU/J785EK]
58	REC_SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON: L)
59	TU FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
60	TU CLK	OUT	CLOCK FOR DATA TRANSFER TO THE TUNER UNIT
61	TU DATA	OUT	TUNING DATA
62	FWE	-	NC
63	NMI(L)	-	NC
64	X2	-	TIMER CLOCK (32.768 kHz)
65	X1	-	TIMER CLOCK (32.768 kHz)
66	RES(L)	-	RESET TERMINAL (RESET ON:L)
67	OSC1(IN)	-	MAIN SYSTEM CLOCK (10MHz)
68	VSS	-	GND
69	OSC2(OUT)	-	MAIN SYSTEM CLOCK (10MHz)
70	VCC	-	SYSTEM POWER
71	MODE	-	NC
72	TU A MUTE(H)	OUT	TUNER AUDIO MUTE CONTROL (MUTE:H)
73	TU V MUTE(H)	OUT	TUNER VIDEO CONTROL (MUTE:H)
74	MESECAM(H)	OUT	MESECAM:H [HR-J680EU/J780EU]
75	I2C CLK2	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
76	I2C DATA2	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
77	SYNC DET(H)	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:H)
78	OSD CS	OUT	CHIP SELECT FOR THE ON-SCREEN IC
79	EE(L)	-	NC
80	R.PAUSE	IN	REMOTE PAUSE CONTROL [HR-J780EU]
81	N.PB_MUTE(H)	OUT	NORMAL AUDIO MUTE CONTROL (MUTE:H)
82	VCC	-	SYSTEM POWER
83	NC	-	NC
84	VSS	-	GND
85	SP_SHORT(H)	OUT	MODE SELECT
86	LP_SHORT(H)	OUT	MODE SELECT
87	H.REC ST(H)	OUT	HiFi AUDIO SOUND RECORDING START
88	A.MUTE(H)	OUT	AUDIO MUTE CONTROL (MUTE:H)
89	PAL_PB(H)	OUT	PAL MODE:H
90	3.58NTSC[H]	-	NC
91	T1	-	NC
92	T2	-	NC
93	P.MUTE(L)	OUT	PICTURE MUTE CONTROL (MUTE:L)
94	SECAM(H)	-	NC
95	SECAM_DET	-	NC
96	T3	-	NC
97	T4	-	NC
98	C.SYNC	IN	COMPOSITE SYNC
99	A.FF	OUT	AUDIO FF OUTPUT
100	V.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
101	CAPPWM	OUT	CAPSTAN MOTOR CONTROL
102	DRUMPWM	OUT	DRUM MOTOR CONTROL
103	NC	-	NC
104	N.REC ST(H)	OUT	NORMAL AUDIO SOUND RECORDING START
105	N.REC(H)	OUT	NORMAL AUDIO REC MODE CONTROL (REC:H)
106	FULLE_ON[H]	OUT	FULL ERASE ON:H
107	DPG	IN	DRUM PICKUP PULSE INPUT (SWITCHING PULSE)
108	DFG	IN	DRUM FG PULSE INPUT
109	VCC	-	SYSTEM POWER
110	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
111	VSS	-	GND
112	CTLREF	-	CTL REFERENCE VOLTAGE

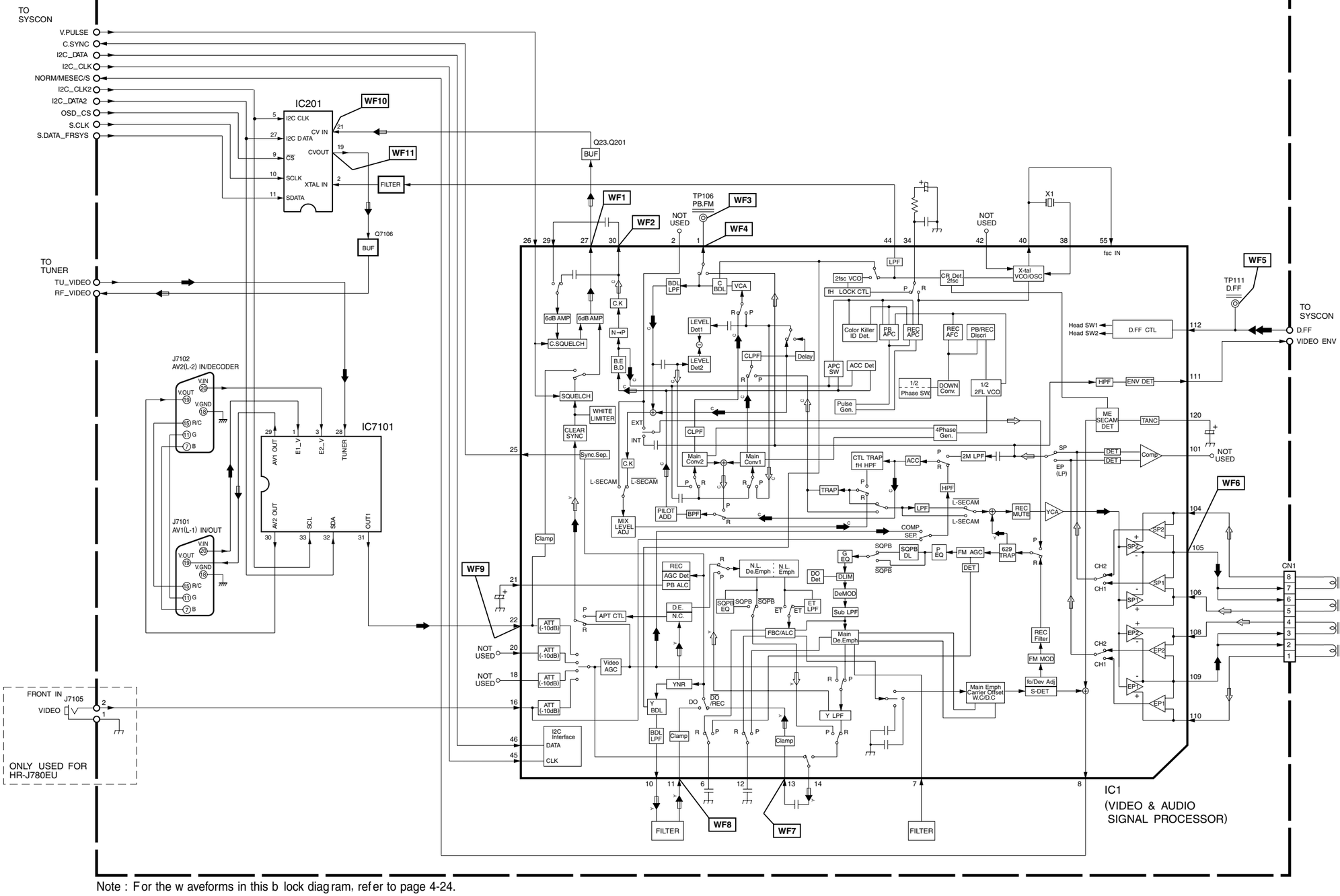
4.15 SYSTEM CONTROL BLOCK DIA GRAM



Note : For the waveforms in this block diagram, refer to page 4-24.

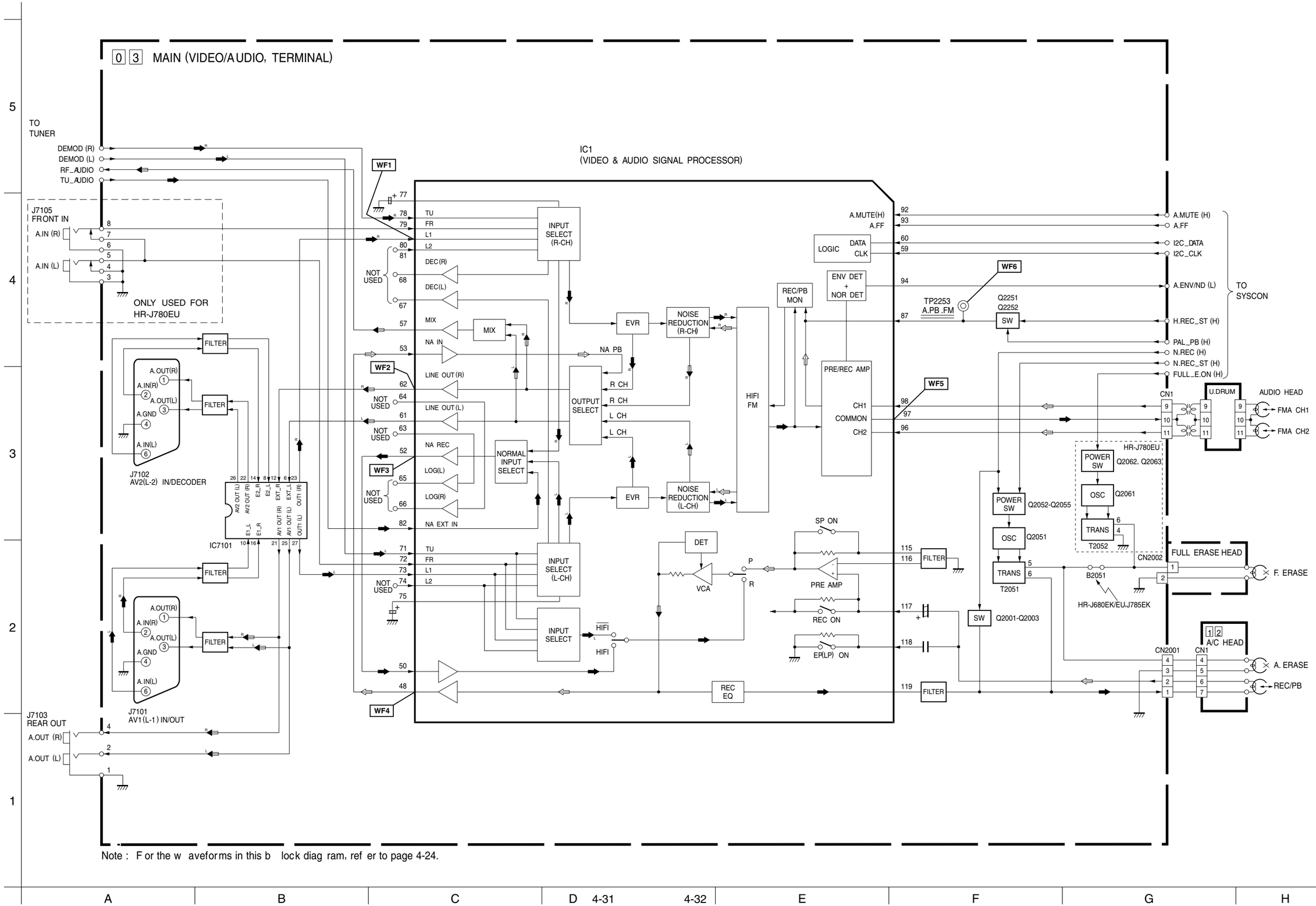
4.16 VIDEO BLOCK DIA GRAM

0 3 MAIN (VIDEO, ON SCREEN, TERMINAL)



Note : For the w aveforms in this b lock diag ram, refer to page 4-24.

4.17 AUDIO BLOCK DIA GRAM



Note : For the waveforms in this block diagram, refer to page 4-24.

E. & O. E. No. 82847
(Sanwa)-V14D1/D15/D1+

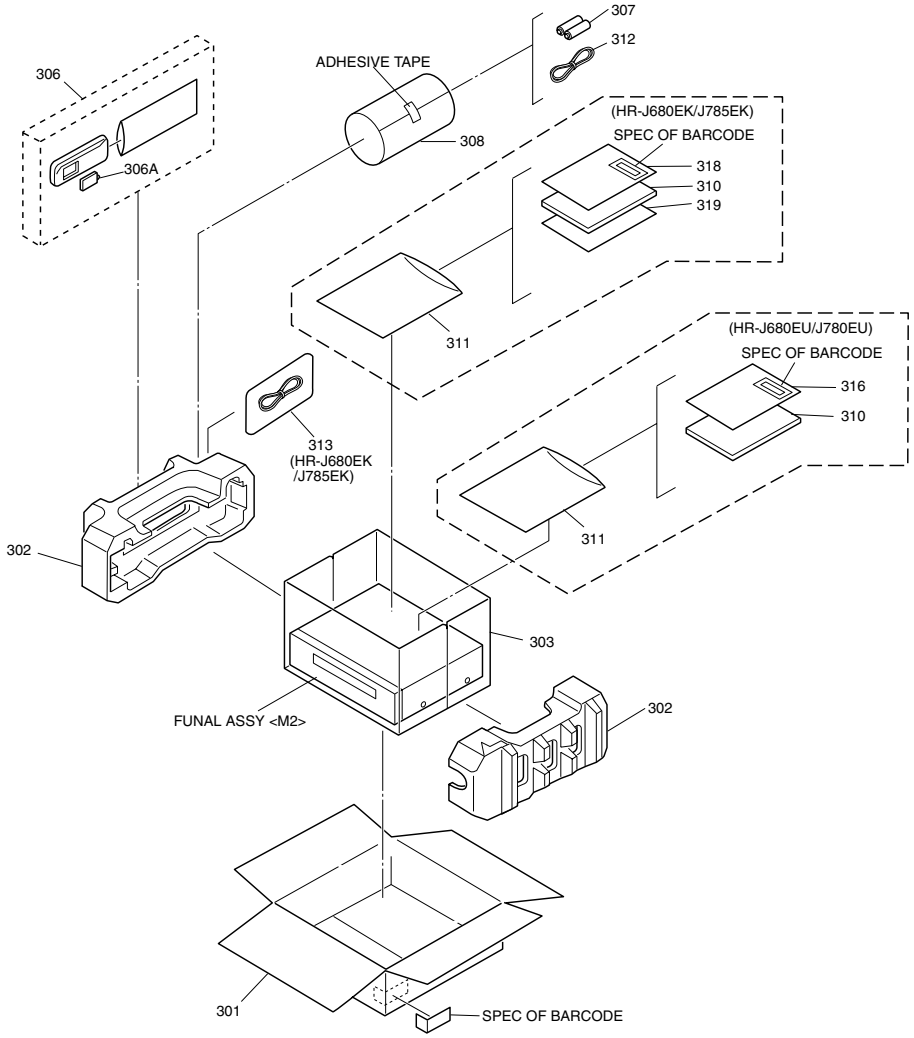
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

PACKING AND ACCESSORY ASSEMBLY <M1>

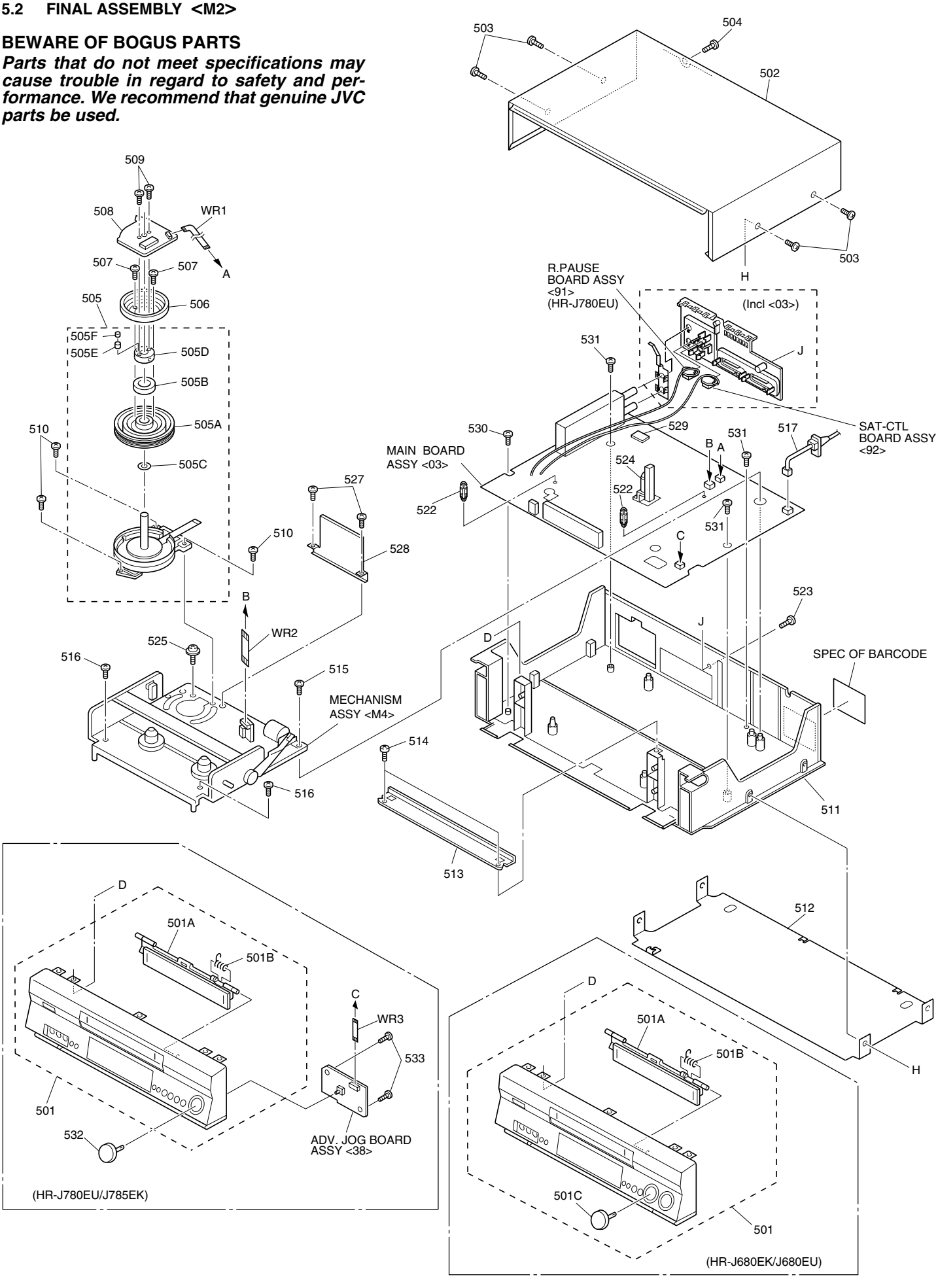
	301	LP30855-001A	PACKING CASE
	302	LP30909-001B	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	306	LP20878-002A	REMOTE CONTROLLER
	306A	LP40610-002A	COVER(BATTERY)
	307	–	BATTERY,X2("R6"TYPE)
	308	QPC02202230P	POLY BAG
⚠	310	LPT0474-001A	INST BOOK(EN),J680EK
⚠		LPT0482-001A	INST BOOK(EN),J680EU
⚠		LPT0482-002A	INST BOOK(GE),J680EU
⚠		LPT0482-003A	INST BOOK(FR),J680EU
⚠		LPT0482-004A	INST BOOK(DU),J680EU
⚠		LPT0482-005A	INST BOOK(SP),J680EU
⚠		LPT0482-006A	INST BOOK(IT),J680EU
⚠		LPT0482-007A	INST BOOK(DA),J680EU
⚠		LPT0482-008A	INST BOOK(FI),J680EU
⚠		LPT0482-009A	INST BOOK(SW),J680EU
⚠		LPT0482-010A	INST BOOK(NO),J680EU
⚠		LPT0482-011A	INST BOOK(PT),J680EU
⚠		LPT0482-012A	INST BOOK(GR),J680EU

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	⚠		LPT0482-013A	INST BOOK(CZ),J680EU
	⚠		LPT0482-014A	INST BOOK(PO),J680EU
	⚠		LPT0482-015A	INST BOOK(HU),J680EU
	⚠		LPT0483-001A	INST BOOK(EN),J780EU
	⚠		LPT0483-002A	INST BOOK(GE),J780EU
	⚠		LPT0483-003A	INST BOOK(FR),J780EU
	⚠		LPT0483-004A	INST BOOK(DU),J780EU
	⚠		LPT0483-005A	INST BOOK(SP),J780EU
	⚠		LPT0483-006A	INST BOOK(IT),J780EU
	⚠		LPT0483-007A	INST BOOK(DA),J780EU
	⚠		LPT0483-008A	INST BOOK(FI),J780EU
	⚠		LPT0483-009A	INST BOOK(SW),J780EU
	⚠		LPT0483-010A	INST BOOK(NO),J780EU
	⚠		LPT0483-011A	INST BOOK(PT),J780EU
	⚠		LPT0483-012A	INST BOOK(GR),J780EU
	⚠		LPT0483-013A	INST BOOK(CZ),J780EU
	⚠		LPT0483-014A	INST BOOK(PO),J780EU
	⚠		LPT0483-015A	INST BOOK(HU),J780EU
	⚠		LPT0545-001A	INST BOOK(EN),J785EK
		311	QPC02503530P	POLY BAG
		312	PEAC0300-02	RF CABLE
		313	QAL0095-005	LED CABLE ASSY(Satellite Controller)J680EK/J785EK
		316	BT-54013-2	WARRANTY CARD,J680EU/J780EU
		318	BT-54008-2	GUARANTY CARD,J680EK/J785EK
		319	LYT0194-001B	Q.CARD(JUK),J680EK/J785EK

5.2 FINAL ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



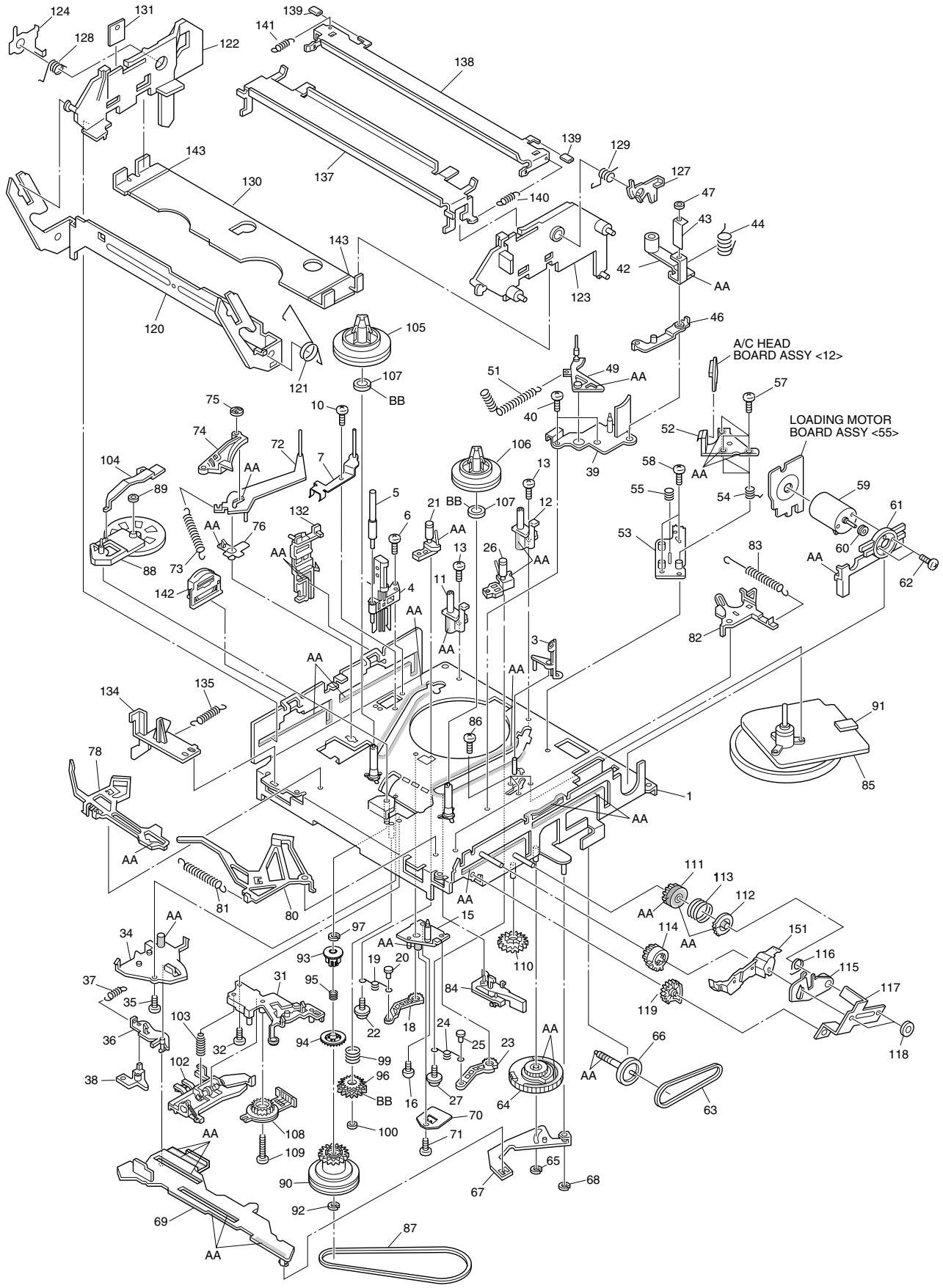
#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
**********				

FINAL ASSEMBLY <M2>

⚠	501	LP10333-001B	FRONT PANEL ASSY,J680EU
⚠		LP10333-005B	FRONT PANEL ASSY,J780EU
⚠		LP10333-009B	FRONT PANEL ASSY,J785EK
⚠		LP10333-012B	FRONT PANEL ASSY,J680EK
	501A	LP20961-001A	CASSETTE DOOR
	501B	PQ46448	TORSION SPRING
	501C	LP30798-001A	BUTTON(OPE),J680EK/EU
⚠	502	LP10013-051A	TOP COVER
	503	QYTDSF3010R	SCREW,X4 TOP COVER(SIDE)
	504	QYTDSF3010M	SCREW,TOP COVER(REAR)
	505	LP20981-002A	DRUM SUB ASSY
	505A	LP20982-002A	UPPER DRUM ASSY
	505B	PDM4439	CAP
	505C	PDM4444-19-2	WASHER
	505D	LP40572-001A	COLLAR ASSY
	505E	LP40323-001A	CONTACT
	505F	LP30004-014A	COMPRESSION SPRING
	506	PDZ0179-1-4	ROTOR ASSY
	507	QYSPSP3006Z	SCREW,X2
⚠	508	QAR0169-002	STATOR ASSY
	509	QYSPSPH2606Z	SCREW,X2
	510	QYTDST2610Z	SCREW,X3 DRUM
⚠	511	LP10108-001E	BOTTOM CHASSIS
⚠	512	LP10014-002B	BOTTOM COVER
	513	LP30312-001B	BRACKET(CHASSIS)
	514	QYTDSF3010Z	SCREW,X2
	515	QYTDSF4012Z	SCREW,MECHA
	516	QYTDSF3010Z	SCREW,X2 MECHA
⚠	517	QMP4A10-170	POWER CORD,J680EU/J780EU
⚠		QMP51K0-170-K	POWER CORD,J680EK/J785EK
	522	LP40226-001A	PC SUPPORT,X2
	523	QYTDSF3010M	SCREW,TERMINAL
	524	LP40253-001B	STOPPER
	525	PQ40413	SPECIAL SCREW,MECHA
	527	LP30356-002C	DRUM SHIELD
	528	QYTDST2606Z	SCREW,X2 DRUM SHIELD
	529	LP30002-042A	SPACER
	530	QYTDSF3010Z	SCREW,MAIN
	531	DPSF3010Z	SCREW,X3
	532	LP30854-001B	KNOB(ADV.JOG),J780EU/J785EK
	533	QYTPSFG2608Z	SCREW,X2,J780EU/J785EK
	WR1	QUQ212-0518CG	FFC WIRE,DRUM CN3001
	WR2	WJT0005-001A	E-CARD WIRE,A/C HEAD CN2001
	WR3	QUQ112-0914CG	FFC WIRE,FRONT CN7001,J780EU/J785EK

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

5.3 MECHANISM ASSEMBLY <M4>



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in **AA** and **BB** indicate lubrication and greasing areas.

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

MECHANISM ASSEMBLY <M4>

		1	LP20821-006A	MAIN DECK ASSY
		3	LP30492-002B	GUIDE POLE GUARD
		4	NAH0001-001	FULL ERASE HEAD
		5	LP40098-001B	GUIDE POLE(SUPPLY)
		6	QYTDST2608Z	SCREW,FE HEAD
		7	LP40637-002A	TENSION STUD BASE ASSY
		10	QYTDST2606Z	SCREW
		11	LP30409-002C	UV CATCHER 2
		12	LP30409-002C	UV CATCHER 2
		13	QYTPST2606Z	SCREW,X2
		15	LP30223-003C	LOADING ARM GEAR SHAFT
		16	QYTDST2606Z	SCREW
		18	LP30224-001B	LOADING ARM GEAR(SUPPLY)
		19	LP40099-001A	TORSION ARM
		20	LP40100-001A	PIN
		21	LP40101-006A	POLE BASE ASSY(SUPPLY)
		22	QYSPSTG2606Z	SCREW
		23	LP40103-002B	LOADING ARM GEAR(TAKE UP)
		24	LP40099-001A	TORSION ARM
		25	LP40100-001A	PIN
		26	LP40104-006A	POLE BASE ASSY(TAKE UP)
		27	QYSPSTG2606Z	SCREW
		31	LP20233-004B	ROTARY ENCODER GUIDE
		32	QYTPST2606Z	SCREW
		34	LP30226-004E	CONTROL PLATE GUIDE
		35	QYTPST2605Z	SCREW
		36	LP30249-003B	TAKE UP LEVER
		37	LP30003-006A	TENSION SPRING
		38	LP40119-002A	TAKE UP HEAD
		39	LP20234-004B	LID GUIDE
		40	QYTDST2606Z	SCREW,X2
		42	LP40105-003A	PINCH ROLLER ARM ASSY
		43	LP40753-001A	PINCH ROLLER SHEET3
		44	LP40148-002A	TORSION SPRING
		46	LP40149-001C	PRESS LEVER ASSY
		49	LP40106-007A	GUIDE ARM ASSY
		51	LP40134-002A	TENSION SPRING
		52	QAH0058-001	AC HEAD
		53	LP30228-001A	HEAD BASE
		54	LP30004-013A	COMPRESSION SPRING,X3
		55	LP40236-001A	COMPRESSION SPRING
		57	LP40213-002B	SPECIAL SCREW,X3
		58	QYTDST2608Z	SCREW,X2
		59	QAR0023-001	LOADING MOTOR
		60	PQ43546-1-2	MOTOR PULLEY
		61	LP30230-001B	MOTOR GUIDE
		62	QYTPSP3003Z	SCREW,X2
		63	LP30005-003A	BELT,LOADING MOTOR
		64	LP20791-002D	CONTROL CAM
		65	PQM30017-24	SLIT WASHER
		66	LP40120-001A	WORM GEAR
		67	LP40107-002A	LINK LEVER ASSY
		68	PQM30017-24	SLIT WASHER
		69	LP10201-003E	CONTROL PLATE
		70	LP40379-001B	CONTROL BRACKET(1)
		71	QYTDSF2608M	SCREW
		72	LP40108-002A	TENSION ARM ASSY
		73	LP30003-010A	TENSION SPRING
		74	LP40109-003D	TENSION BRAKE ASSY
		75	PQ46302-1-3	ADJUST PIN
		76	LP30232-002A	TENSION ARM BEARING
		78	LP40532-008B	MAIN BRAKE ASSY (SUPPLY)
		80	LP40111-011A	MAIN BRAKE ASSY (TAKE UP)
		81	LP30003-026A	TENSION SPRING
		82	LP40112-001F	SUB BRAKE ASSY(TAKE UP)
		83	LP40357-002A	TENSION SPRING
		84	LP40461-001A	CAPSTAN BRAKE ASSY
		85	QAR0087-005	CAPSTAN MOTOR
		86	QYTDSF2606M	SCREW,X3
		87	LP30005-007A	BELT,CAPSTAN MOTOR
		88	LP40114-012A	IDLER ARM ASSY
		89	LP40599-001A	WASHER
		90	LP40593-001A	CLUTCH UNIT 3
		91	LP30002-097A	SPACER,CAPSTAN MOTOR
		92	PQM30017-47	SLIT WASHER
		93	LP30696-002A	CLUTCH GEAR 4
		94	LP30697-003A	COUPLING GEAR
		95	LP40554-002A	COMPRESSION SPRING
		96	LP40442-001A	DIRECT GEAR
		97	LP30017-019A	SPACER
		99	LP40483-002A	COMPRESSION SPRING
		100	LP30016-001A	SLIT WASHER
		102	LP40484-001J	CHANGE LEVER ASSY
		103	LP40512-002B	COMPRESSION SPRING
		104	LP30236-002C	IDLER LEVER
		105	LP20237-001B	REEL DISK (SUPPLY)
		106	LP20238-001B	REEL DISK (TAKE UP)
		107	LP30017-015A	SPACER,X2
		108	QSW0554-003	ROTARY ENCODER
		109	QYTPST2620Z	SCREW
		110	LP30237-002B	CASSETTE GEAR
		111	LP30239-002G	LIMIT GEAR(1)
		112	LP30240-002G	LIMIT GEAR(2)
		113	LP40136-001E	TORSION SPRING
		114	LP30242-002A	RELAY GEAR
		115	LP30339-002E	OPENER GUIDE
		116	LP40545-001A	TORSION SPRING
		117	LP40214-001B	C.H.BRACKET
		118	PQM30017-47	SLIT WASHER,X2
		119	LP30243-001D	DRIVE GEAR
		120	LP20240-001G	DRIVE ARM
		121	LP40137-001A	TORSION SPRING
		122	LP10081-002L	SIDE HOLDER(L)
		123	LP10082-002M	SIDE HOLDER(R)
		124	LP30255-006A	LOCK LEVER(L)
		127	LP30256-001H	LOCK LEVER(R)
		128	LP40168-003A	TORSION SPRING(L)
		129	LP40218-001B	TORSION SPRING(R)
		130	LP30257-001G	CASSETTE HOLDER
		131	LP40852-001A	EARTH PLATE
		132	LP30244-002G	GUIDE RAIL
		134	LP30245-002F	REC SAFETY LEVER
		135	LP30003-004A	TENSION SPRING
		137	LP20578-001C	TOP GUIDE
		138	LP30500-001C	HOLD PLATE
		139	LP40450-003A	PAD,X2
		140	LP30003-025B	TENSION SPRING
		141	LP30003-024A	TENSION SPRING
		142	LP40481-003A	ROLLER CAM ASSY
		143	LP30019-014A	PAD,X2
		151	LP20324-003B	DOOR OPENER

5.4 ELECTRICAL PARTS LIST

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
**********				

MAIN BOARD ASSEMBLY <03>

		PW1	LPA10131-01D1	MAIN BOARD ASSY,J680EU
			LPA10131-02C1	MAIN BOARD ASSY,J785EK
			LPA10131-04D1	MAIN BOARD ASSY,J780EU
			LPA10131-05C1	MAIN BOARD ASSY,J680EK
		IC1	JCP8020-MSD-2	IC
		IC201	LC74775-9750	IC
		IC3001	HD6432194SXD01F	IC(MCU),J680EK/J785EK
			HD6432194SXD14F	IC(MCU),J680EU/J780EU
		IC3002	IC-PST3427U-X	IC
		IC3003	AT24C16N-10SC-X	IC
			or BR24C16F	IC
			or X24C16S	IC
			or 24LC16B/SN-X	IC
		IC3004	BA6956AN	IC
		IC5301	L5431	IC
			or MM1431AT	IC
		IC6701	MSP3417D	IC
			or MSP3417DG3	IC
		IC7001	PT6956	IC
		IC7002	GP1U291Q	IR DETECT UNIT
			or PIC-28143LJ	IR DETECT UNIT
			or PNA4652M00YC	IR DETECT UNIT
		IC7101	MM1443XJ	IC
		Q1	2SC4081/S/-X	TRANSISTOR
		Q2	2SC4081/S/-X	TRANSISTOR
		Q3	2SC4081/S/-X	TRANSISTOR
		Q4	2SC4081/S/-X	TRANSISTOR
		Q23	2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q38	2SC4081/QRS/-X	TRANSISTOR
		Q41	UN521E	TRANSISTOR,J680EU/J780EU
			or RN1309	TRANSISTOR,J680EU/J780EU
			or DTC144WU	TRANSISTOR,J680EU/J780EU
		Q201	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2001	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2002	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2003	DTA144WU	TRANSISTOR
			or PDTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
			or UN511E	TRANSISTOR
		Q2006	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2051	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2052	2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
		Q2053	DTC144WU	TRANSISTOR
			or PDTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
			or UN521E	TRANSISTOR
		Q2054	2SA1576A/QR/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2055	DTC144WU	TRANSISTOR
			or PDTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
			or UN521E	TRANSISTOR
		Q2061	2SC4081/QRS/-X	TRANSISTOR,J780EU
			or 2SD1819A/QRS/-X	TRANSISTOR,J780EU
			or 2PC4081/R/-X	TRANSISTOR,J780EU
		Q2062	2SA1576A/QR/-X	TRANSISTOR,J780EU
			or 2SB1218A/QR/-X	TRANSISTOR,J780EU
			or 2PA1576/R/-X	TRANSISTOR,J780EU
		Q2063	DTC144WU	TRANSISTOR,J780EU
			or PDTC144WU	TRANSISTOR,J780EU
			or RN1309	TRANSISTOR,J780EU
			or UN521E	TRANSISTOR,J780EU
		Q2251	DTA144WU	TRANSISTOR
			or PDTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
			or UN511E	TRANSISTOR
		Q2252	DTC114EU	TRANSISTOR
			or PDTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
			or UN5211	TRANSISTOR
		Q3001	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q3003	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV16A	PHOTO TRANSISTOR
		Q3004	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q3005	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q3007	UN521E	TRANSISTOR
			or PDTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR
		Q4001	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or PDTC114EU	TRANSISTOR
		Q5101	2SK2632-CB14	POWER MOS FET
			or 2SK2632	POWER MOS FET
			or 2SK2129	POWER MOS FET
			or 2SK2129-LT	POWER MOS FET
		Q5102	2SD2144S/UV/-T	TRANSISTOR
		Q5302	2SD2375/QP/	TRANSISTOR
		Q5303	2SD1819A/RS/-X	TRANSISTOR
			or 2SC4081/RS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q5304	2SC3616/ML/-T	TRANSISTOR
		Q5305	DTA114EU	TRANSISTOR
			or RN2302	TRANSISTOR
			or UN5111	TRANSISTOR
			or PDTA114EU	TRANSISTOR
		Q5306	DTC114EU	TRANSISTOR
			or PDTC114EU	TRANSISTOR

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
			or RN1302	TRANSISTOR	
			or UN5211	TRANSISTOR	
		Q5308	2SA1576A/RS/-X	TRANSISTOR	
		Q6030	2SB1218A/RS/-X	TRANSISTOR	
		Q6031	DTC114EU	TRANSISTOR	
			or PDTC114EU	TRANSISTOR	
			or RN1302	TRANSISTOR	
			or UN5211	TRANSISTOR	
		Q6032	DTC114EU	TRANSISTOR	
			or RN1302	TRANSISTOR	
			or UN5211	TRANSISTOR	
			or PDTC114EU	TRANSISTOR	
		Q7001	DTA143TU	TRANSISTOR	
		Q7002	DTA143TU	TRANSISTOR	
		Q7003	DTA143TU	TRANSISTOR	
		Q7004	DTA143TU	TRANSISTOR	
		Q7005	DTA143TU	TRANSISTOR	
		Q7101	2SB1218A/QRS/-X	TRANSISTOR	
			or 2SA1576A/QRS/-X	TRANSISTOR	
			or 2PA1576/R/-X	TRANSISTOR	
		Q7102	DTC144WU	TRANSISTOR	
			or PDTC144WU	TRANSISTOR,J680EK/EU/J780EU	
			or RN1309	TRANSISTOR,J680EK/EU/J780EU	
			or UN521E	TRANSISTOR,J680EK/EU/J780EU	
		Q7106	2SA1576A/QRS/-X	TRANSISTOR	
			or 2PA1576/R/-X	TRANSISTOR	
		Q7107	DTA144WU	TRANSISTOR	
			or PDTA144WU	TRANSISTOR	
			or RN2309	TRANSISTOR	
			or UN511E	TRANSISTOR	
		Q7108	DTC144WU	TRANSISTOR	
			or PDTC144WU	TRANSISTOR	
			or RN1309	TRANSISTOR	
			or UN521E	TRANSISTOR	
		Q7109	2SC4081/QRS/-X	TRANSISTOR	
			or 2SD1819A/QRS/-X	TRANSISTOR	
			or 2PC4081/R/-X	TRANSISTOR	
		Q7110	2SC4081/QRS/-X	TRANSISTOR	
			or 2PC4081/R/-X	TRANSISTOR	
			or 2SD1819A/QRS/-X	TRANSISTOR	
		Q7201	2SC1317/RS/-T	TRANSISTOR	
		D6	MTZJ5.6C	ZENER DIODE	
			or RD5.6ES/B3/-T2	ZENER DIODE	
		D201	QRE141J-101Y	RESISTOR	100Ω,1/4W
		D202	QRE141J-101Y	RESISTOR	100Ω,1/4W
		D203	QRE141J-101Y	RESISTOR	100Ω,1/4W
		D2101	MTZJ8.2C	ZENER DIODE	
		D3001	LNB2301L01VI	LE DIODE	
		D3002	1SS133	DIODE	
			or 1SS270A	DIODE	
		D3003	RD39ES/B3/-T2	ZENER DIODE	
			or MTZJ39C	ZENER DIODE	
		D3004	11ES2	DIODE	
			or 1A3G	DIODE	
		D3005	11ES2	DIODE	
			or 1A3G	DIODE	
		D3008	1SS133	DIODE	
		D4001	QUY153-050Y	IM BUS WIRE	
		D4002	QUY153-050Y	IM BUS WIRE	
		D5001	S1WB/A/60-4102	BRIDGE DIODE	
			or S1WB/A/60-X	BRIDGE DIODE	

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
			or S1WB(A)60F4072X	BRIDGE DIODE	
		D5101	AU01	FR DIODE	
			or ERA18-04-T2	FR DIODE	
			or 10ELS4	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
		D5102	AU01	FR DIODE	
			or ERA18-04-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS4	FR DIODE	
		D5103	1SS133	DIODE	
			or 1SS270A	DIODE	
		D5105	1SS133	DIODE	
			or 1SS270A	DIODE	
		D5203	AU01Z	FR DIODE	
			or 10ELS2	FR DIODE	
		D5204	AU01Z	FR DIODE	
			or 10ELS2	FR DIODE	
		D5208	RK14LF-B2	BARRIER DIODE	
			or SB240-F26	SB DIODE	
			or 21DQ04	BARRIER DIODE	
		D5210	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
			or PG104RS	FR DIODE	
		D5301	MTZJ15C	ZENER DIODE	
			or RD15ES/B3/-T2	ZENER DIODE	
		D5302	1SS133	DIODE	
			or 1SS270A	DIODE	
		D5303	RD5.1JS/B2/-T2	ZENER DIODE	
			or MA4051N/M/-T2	ZENER DIODE	
		D5304	1SS133	DIODE	
			or 1SS270A	DIODE	
		D5305	AK04	DIODE	
			or 11EQS04	SB DIODE	
			or 1S4	SB DIODE	
		D5307	QUY160-100Y	IM BUS WIRE	
		D5308	MTZJ11C	ZENER DIODE	
			or RD11ES/B3/-T2	ZENER DIODE	
		D5316	QUY160-100Y	IM BUS WIRE	
		D6002	HZ30-2L-T2	ZENER DIODE	
			or HZ30-2LTD	Z DIODE (M)	
		D6701	1SS133	DIODE	
		D7101	1SS133	DIODE	
		D7102	1SS133	DIODE	
		D7103	QUY160-100Y	IM BUS WIRE	
		D7105	MTZJ12C	ZENER DIODE	
			or RD12ES/B3/-T2	ZENER DIODE	
		D7106	MTZJ12C	ZENER DIODE	
			or RD12ES/B3/-T2	ZENER DIODE	
		R1	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3	NRSA02J-822X	MG RESISTOR	8.2kΩ,1/10W
		R5	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R7	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R8	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R9	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R12	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R21	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R22	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R37	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R46	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R50	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R77	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R90	NRSA02J-391X	MG RESISTOR	390Ω,1/10W
		R92	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R93	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R104	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R202	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R209	NRSA02J-512X	MG RESISTOR	5.1kΩ,1/10W
		R210	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R211	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R213	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R224	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R225	QUY160-100Y	IM BUS WIRE	
		R2001	QRE141J-681Y	RESISTOR	680Ω,1/4W
		R2002	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2003	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2004	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2006	NRSA02J-393X	MG RESISTOR,J780EU	39kΩ,1/10W
		R2007	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R2009	NRSA02J-123X	MG RESISTOR,J780EU	12kΩ,1/10W
		R2010	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2013	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2014	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R2015	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R2016	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R2017	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2022	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR,J680EK/EU/J785EK	12kΩ,1/10W
			NRSA02J-153X	MG RESISTOR,J780EU	15kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	QRE141J-101Y	RESISTOR,J780EU	100Ω,1/4W
			QRE141J-820Y	RESISTOR,J680EK/EU/J785EK	82Ω,1/4W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2061	NRSA63J-273X	MG RESISTOR,J780EU	27kΩ,1/16W
		R2062	NRSA63J-3R3X	MG RESISTOR,J780EU	3.3Ω,1/16W
		R2063	QRE141J-151Y	RESISTOR,J780EU	150Ω,1/4W
		R2064	NRSA63J-473X	MG RESISTOR,J780EU	47kΩ,1/16W
		R2065	NRSA63J-183X	MG RESISTOR,J780EU	18kΩ,1/16W
		R2201	QRE141J-151Y	RESISTOR	150Ω,1/4W
		R2206	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2207	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R2218	NRSA02J-393X	MG RESISTOR,J780EU	39kΩ,1/10W
		R2219	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R2223	NRSA02J-123X	MG RESISTOR,J780EU	12kΩ,1/10W
		R2224	QRE141J-123Y	RESISTOR	12kΩ,1/4W
		R2226	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2227	QRE141J-123Y	RESISTOR	12kΩ,1/4W
		R2228	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2229	NRSA02J-563X	MG RESISTOR	56kΩ,1/10W
		R2251	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3013	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3014	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3015	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3016	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3019	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R3020	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3021	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3022	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3026	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3027	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3028	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3029	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3030	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3031	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3032	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3033	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3034	QUY160-100Y	IM BUS WIRE	
		R3035	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3036	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3037	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3038	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3039	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3041	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3042	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3044	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3046	NRSA02J-0R0X	MG RESISTOR,J785EK	0Ω,1/10W
		R3047	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3048	NRSA63J-0R0X	MG RESISTOR	0Ω,1/16W
		R3049	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3050	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3051	NRSA02J-102X	MG RESISTOR,J785EK	1kΩ,1/10W
		R3052	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3053	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3054	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3055	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3056	NRSA02J-472X	MG RESISTOR,J780EU/J785EK	4.7kΩ,1/10W
		R3057	NRSA02J-472X	MG RESISTOR,J780EU/J785EK	4.7kΩ,1/10W
		R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3059	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3060	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3061	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3062	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3066	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3069	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3071	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3072	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3073	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3074	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3075	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3076	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3077	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3078	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3080	NRSA02J-472X	MG RESISTOR,J780EU	4.7kΩ,1/10W
		R3081	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3085	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3086	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3087	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3088	QUY160-100Y	IM BUS WIRE	
		R3089	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3090	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3093	QUY160-100Y	IM BUS WIRE	
		R3104	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R3105	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R3106	QUY160-100Y	IM BUS WIRE,J780EU	
		R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R3205	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R3207	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3208	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R3209	QRE141J-273Y	RESISTOR	27kΩ,1/4W
		R3210	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3211	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3212	NRSA02J-474X	MG RESISTOR	470kΩ,1/10W
		R3213	NRSA02J-334X	MG RESISTOR	330kΩ,1/10W
		R3214	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3215	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3217	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R3218	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3219	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3220	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R3222	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3223	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3224	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3225	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3226	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3227	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3229	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3230	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3231	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3232	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3234	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R3235	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R3236	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R3240	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3244	NRSA02J-333X	MG RESISTOR,J780EU/J785EK	33kΩ,1/10W
		R3245	NRSA02J-333X	MG RESISTOR,J780EU/J785EK	33kΩ,1/10W
		R3251	NRSA02J-103X	MG RESISTOR,J780EU	10kΩ,1/10W
		R4003	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R4004	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R4005	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R4007	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R4008	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R4009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4010	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4011	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R4012	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4013	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4014	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R4015	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R4017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4019	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4020	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R5101	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R5102	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
		R5104	QRG02GJ-683	OMF RESISTOR	68kΩ,2W
		R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
		R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
		R5108	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R5109	QRE141J-681Y	RESISTOR	680Ω,1/4W
		R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R5111	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R5112	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R5301	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R5302	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R5304	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5305	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5306	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5308	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5309	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R5310	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5311	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R5312	QRE141J-332Y	RESISTOR	3.3kΩ,1/4W
		R5313	NRSA02D-332X	MG RESISTOR	3.3kΩ,1/10W
		R5314	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5316	NRSA02D-123X	MG RESISTOR	12kΩ,1/10W
		R5317	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R5320	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R5321	QRE141J-273Y	RESISTOR	27kΩ,1/4W
		R6020	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6021	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6030	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6031	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R6032	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R6033	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R6050	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R6051	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6052	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6702	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R6707	NRSA02J-330X	MG RESISTOR	33Ω,1/10W
		R6708	QUY153-050Y	IM BUS WIRE	
		R6709	QUY153-050Y	IM BUS WIRE	
		R6710	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6711	NRSA02J-684X	MG RESISTOR	680kΩ,1/10W
		R6712	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6713	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R6714	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6715	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R6716	NRSA02J-470X	MG RESISTOR	47Ω,1/10W
		R6719	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R6720	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R6721	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R7001	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7015	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7022	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7037	NRSA02J-563X	MG RESISTOR	56kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R7101	NRSA63J-473X	MG RESISTOR	47kΩ,1/16W
		R7102	NRSA63J-102X	MG RESISTOR	1kΩ,1/16W
		R7103	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7105	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7107	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7108	QRE141J-750Y	RESISTOR	75Ω,1/4W
		R7110	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R7111	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R7112	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7113	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7114	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R7116	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R7117	QRE141J-750Y	RESISTOR	75Ω,1/4W
		R7119	NQL402M-4R7X	COIL	4.7µH
		R7120	NQL402M-4R7X	COIL	4.7µH
		R7122	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7124	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7131	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R7133	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7134	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7135	NQR0148-002X	FERRITE BEAD	
		R7136	NQR0148-002X	FERRITE BEAD	
		R7137	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7139	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R7140	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7142	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R7144	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R7146	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7147	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7148	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7149	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7150	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7160	NRSA02J-331X	MG RESISTOR,J780EU	330Ω,1/10W
		R7161	NRSA02J-101X	MG RESISTOR,J780EU	100Ω,1/10W
		R7162	NRSA02J-331X	MG RESISTOR,J780EU	330Ω,1/10W
		R7163	NRSA02J-750X	MG RESISTOR,J780EU	75Ω,1/10W
		R7202	QRE141J-221Y	RESISTOR	220Ω,1/4W
		R7203	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7204	QRE123J-100X	RESISTOR	10Ω,1/2W
		R7205	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
		R7206	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
		B5	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B24	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B28	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B35	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B71	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B204	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B2051	NRSA02J-0R0X	MG RESISTOR,J680EU/J785EK	0Ω,1/10W
		B3002	QUY153-050Y	IM BUS WIRE	
		B3004	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B3005	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B5302	QUY153-050Y	IM BUS WIRE	
		B6701	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B7003	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B7008	NRSA02J-0R0X	MG RESISTOR,J680EK/EU	0Ω,1/10W
		B7009	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B7118	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		B7120	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C1	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C2	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C3	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C4	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C5	QEKJ0JM-227	E CAPACITOR	220µF,6.3V
		C6	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C8	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C10	NDC21HJ-151X	CAPACITOR	150pF,50V
		C11	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C12	NDC21HJ-470X	CAPACITOR	47pF,50V
		C14	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C15	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C16	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C17	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
		C19	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
		C20	QEQF1HM-105	NP E CAPACITOR	1µF,50V
		C21	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C22	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C23	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C24	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C25	NDC21HJ-6R0X	CAPACITOR	6pF,50V
		C27	NCB21EK-223X	CAPACITOR	0.022µF,25V
		C28	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
		C29	NCB21EK-333X	CAPACITOR	0.033µF,25V
		C30	QEKJ1HM-474	E CAPACITOR	0.47µF,50V
		C31	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C32	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C33	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
		C34	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C35	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C36	QERF1EM-475	E CAPACITOR	4.7µF,25V
		C37	QEKJ1HM-105	E CAPACITOR	1µF,50V
		C38	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C39	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C40	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C43	NCB21HK-102X	CAPACITOR	0.001µF,50V
		C51	QEKJ1HM-105	E CAPACITOR,J780EU	1µF,50V
		C53	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C62	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C64	NDC21HJ-220X	CAPACITOR	22pF,50V
		C65	QEKJ1HM-105	E CAPACITOR	1µF,50V
		C69	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C70	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C81	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C92	NDC21HJ-330X	CAPACITOR	33pF,50V
		C94	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C106	NCB21HK-821X	CAPACITOR	820pF,50V
		C108	NDC21HJ-680X	CAPACITOR	68pF,50V
		C109	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C110	NDC21HJ-820X	CAPACITOR	82pF,50V
		C114	NDC21HJ-181X	CAPACITOR,J680EU/J780EU	180pF,50V
		C204	NDC21HJ-100X	CAPACITOR	10pF,50V
		C206	NDC21HJ-330X	CAPACITOR	33pF,50V
		C207	NDC21HJ-330X	CAPACITOR	33pF,50V
		C209	NCB21CK-474X	CAPACITOR	0.47µF,16V
		C212	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C213	QERF1HM-475	E CAPACITOR	4.7µF,50V
		C214	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C215	NCB21CK-224X	CAPACITOR	0.22µF,16V
		C216	QERF1AM-227	E CAPACITOR	220µF,10V
		C217	NDC21HJ-560X	CAPACITOR	56pF,50V
		C218	NCB21CK-105X	CAPACITOR	1µF,16V
		C222	QERF1HM-105	E CAPACITOR	1µF,50V
		C226	QERF0JM-107	E CAPACITOR	100µF,6.3V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C2001	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2002	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2003	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C2005	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2006	NCB21HK-123X	CAPACITOR	0.012µF,50V
		C2007	QEKJ1CM-226	E CAPACITOR	22µF,16V
		C2008	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2009	NCB21HK-102X	CAPACITOR	0.001µF,50V
		C2010	NCB21HK-152X	CAPACITOR	0.0015µF,50V
		C2011	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2012	QEKC1HM-475	E CAPACITOR	4.7µF,50V
		C2016	NDC21HJ-330X	CAPACITOR	33pF,50V
		C2051	NCB21HK-331X	CAPACITOR	330pF,50V
		C2052	QFLC1HJ-333Z	F CAPACITOR,J780EU	0.033µF,50V
			QFLC1HJ-823Z	F CAPACITOR,J680EK/EU/J785EK	0.082µF,50V
		C2053	NCB21HK-332X	CAPACITOR,J780EU	0.0033µF,50V
			NCB21HK-472X	CAPACITOR,J680EK/EU/J785EK	0.0047µF,50V
		C2054	NCB21EK-223X	CAPACITOR,J680EK/EU/J785EK	0.022µF,25V
			NCB21HK-103X	CAPACITOR,J780EU	0.01µF,50V
		C2055	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2061	QFLC1HJ-333Z	F CAPACITOR,J780EU	0.033µF,50V
		C2062	NCB31HK-332X	CAPACITOR,J780EU	0.0033µF,50V
		C2063	NCB31EK-103X	CAPACITOR,J780EU	0.01µF,25V
		C2064	QEKJ1EM-106	E CAPACITOR,J780EU	10µF,25V
		C2201	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C2202	NCB21EK-333X	CAPACITOR	0.033µF,25V
		C2203	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2204	NCB21HK-102X	CAPACITOR	0.001µF,50V
		C2205	QEKJ1HM-105	E CAPACITOR	1µF,50V
		C2206	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2207	QEKJ1CM-476	E CAPACITOR	47µF,16V
		C2208	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2215	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2217	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2219	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2220	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2221	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C2222	QEKJ1HM-474	E CAPACITOR	0.47µF,50V
		C2223	QEKJ1HM-474	E CAPACITOR	0.47µF,50V
		C2224	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C2225	QEKJ1HM-475	E CAPACITOR	4.7µF,50V
		C2226	QEKJ1EM-106	E CAPACITOR	10µF,25V
		C2227	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C2228	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C2251	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C2252	QDYB1CM-103Y	CAPACITOR	0.01µF,16V
		C2253	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C2254	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C2255	NDC21HJ-181X	CAPACITOR	180pF,50V
		C3001	NCF21EZ-104X	CAPACITOR	0.1µF,25V
		C3002	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C3003	QEKJ1HM-106	E CAPACITOR	10µF,50V
		C3004	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3011	QETL0JM-338	E CAPACITOR	3300µF,6.3V
		C3012	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C3014	QERF0JM-476	E CAPACITOR	47µF,6.3V
		C3016	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3022	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3024	NDC21HJ-120X	CAPACITOR,J785EK	12pF,50V
			NDC21HJ-220X	CAPACITOR,J680EK/EU/J780EU	22pF,50V
		C3025	QAT3725-300Z	TRIM CAPACITOR,TIMER CLOCK,J680EU/J780EU	

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C3026	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C3027	QEKJ1CM-106	E CAPACITOR	10µF,16V
		C3030	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C3031	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3032	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3033	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3036	NDC21HJ-180X	CAPACITOR	18pF,50V
		C3037	NDC21HJ-120X	CAPACITOR	12pF,50V
		C3040	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C3041	NDC21HJ-100X	CAPACITOR,J680EK/J785EK	10pF,50V
		C3045	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3050	NCF21EZ-104X	CAPACITOR	0.1µF,25V
		C3051	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C3101	QER61CM-106	E CAPACITOR	10µF,16V
		C4002	QDYB1CM-103Y	CAPACITOR	0.01µF,16V
		C4003	NCB21HK-102X	CAPACITOR	0.001µF,50V
		C4004	QERF1CM-226	E CAPACITOR	22µF,16V
		C4005	NCB21HK-222X	CAPACITOR	0.0022µF,50V
		C4006	QERF0JM-476	E CAPACITOR	47µF,6.3V
		C4007	NCB31HK-561X	CAPACITOR,J780EU	560pF,50V
		C4008	QEQF1HM-105	NP E CAPACITOR	1µF,50V
		C4009	NCB21HK-563X	CAPACITOR	0.056µF,50V
		C4010	NCB21EK-223X	CAPACITOR	0.022µF,25V
		C4011	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C4012	QERF1HM-105	E CAPACITOR	1µF,50V
		C4013	NCB21HK-563X	CAPACITOR	0.056µF,50V
		C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4015	NCB21HK-102X	CAPACITOR	0.001µF,50V
		C4016	NDC21HJ-101X	CAPACITOR	100pF,50V
	⚠	C5001	QFZ9073-683	F CAPACITOR	0.068µF,250V
	⚠	C5002	QFZ9051-333	F CAPACITOR	0.033µF,250V
	⚠	C5004	QCZ9071-222	CAPACITOR	0.0022µF,250V
		C5006	QEZ0375-686	E CAPACITOR	68µF,400V
		C5101	QCZ0212-472	CAPACITOR	0.0047µF,1kV
		C5102	QCZ0302-330Z	CAPACITOR	33pF,1kV
		C5104	QEKC1HM-105	E CAPACITOR	1µF,50V
		C5105	QFN31HJ-183	F CAPACITOR	0.018µF,50V
		C5106	QCBB1HJ-271	CAPACITOR	270pF,50V
		C5107	QFV91HJ-104	F CAPACITOR	0.1µF,50V
		C5202	QEMT1CM-687	E CAPACITOR	680µF,16V
		C5203	QEMT1AM-128	E CAPACITOR	1200µF,10V
		C5204	QETN2AM-475	E CAPACITOR	4.7µF,100V
		C5206	QETN1AM-476	E CAPACITOR	47µF,10V
		C5207	QETN1CM-107	E CAPACITOR	100µF,16V
		C5301	QEKJ1CM-107	E CAPACITOR	100µF,16V
		C5302	QETJ1CM-107	E CAPACITOR	100µF,16V
		C5303	QEKJ1CM-107	E CAPACITOR	100µF,16V
		C5304	QFLC1HJ-102Z	F CAPACITOR	0.001µF,50V
		C5305	QFV91HJ-154	F CAPACITOR	0.15µF,50V
		C6005	QETJ1HM-106	E CAPACITOR	10µF,50V
		C6007	QEKC0JM-227	E CAPACITOR	220µF,6.3V
		C6012	QEKJ1AM-107	E CAPACITOR	100µF,10V
		C6013	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C6016	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C6023	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C6027	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C6032	NCB21EK-473X	CAPACITOR	0.047µF,25V
		C6037	QEKJ1CM-106	E CAPACITOR	10µF,16V
		C6701	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C6704	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C6707	NDC21HJ-470X	CAPACITOR	47pF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C6708	NDC21HJ-8R0X	CAPACITOR	8pF,50V
		C6709	NDC21HJ-2R0X	CAPACITOR	2pF,50V
		C6713	NCF21CZ-224X	CAPACITOR	0.22μF,16V
		C6714	NCB21HK-682X	CAPACITOR	0.0068μF,50V
		C6715	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C6716	NCB21HK-682X	CAPACITOR	0.0068μF,50V
		C6717	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C6719	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C6720	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C6721	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6723	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7001	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7002	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C7011	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
		C7012	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7103	NCB21HK-681X	CAPACITOR	680pF,50V
		C7104	NCB21HK-681X	CAPACITOR	680pF,50V
		C7117	QUY153-050Y	IM BUS WIRE	
		C7119	NCB21HK-471X	CAPACITOR	470pF,50V
		C7120	NCB21HK-471X	CAPACITOR	470pF,50V
		C7128	QEKJ1CM-107	E CAPACITOR	100μF,16V
		C7129	NCB31CK-104X	CAPACITOR	0.1μF,16V
		C7131	QUY153-050Y	IM BUS WIRE	
		C7132	QETN1CM-107	E CAPACITOR	100μF,16V
		C7133	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7134	NCB31CK-473X	CAPACITOR	0.047μF,16V
		C7135	NCB31CK-473X	CAPACITOR	0.047μF,16V
		C7136	NCB31CK-473X	CAPACITOR	0.047μF,16V
		C7137	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7138	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7139	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7140	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7141	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7142	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7143	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7144	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7145	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7146	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C7147	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7148	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7149	QEKJ1HM-475	E CAPACITOR	4.7μF,50V
		C7150	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7151	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7152	NCB21EK-473X	CAPACITOR	0.047μF,25V
		C7153	NDC21HJ-330X	CAPACITOR	33pF,50V
		C7155	QEKJ1EM-106	E CAPACITOR	10μF,25V
		C7164	NCB21HK-681X	CAPACITOR,J780EU	680pF,50V
		C7166	NCB21HK-681X	CAPACITOR,J780EU	680pF,50V
		C7168	NCB21HK-681X	CAPACITOR	680pF,50V
		C7169	NCB21HK-681X	CAPACITOR	680pF,50V
		C7170	NCB21HK-821X	CAPACITOR	820pF,50V
		C7171	NCB21HK-821X	CAPACITOR	820pF,50V
		C7172	NDC21HJ-101X	CAPACITOR	100pF,50V
		C7173	NDC21HJ-101X	CAPACITOR	100pF,50V
		C7174	NCB21HK-681X	CAPACITOR	680pF,50V
		C7175	NCB21HK-681X	CAPACITOR	680pF,50V
		C7202	QETJ0JM-477	E CAPACITOR	470μF,6.3V
		L1	QQL29BJ-100Z	COIL	10μH
		L2	QUY153-050Y	IM BUS WIRE	
		L3	QQL29BJ-100Z	COIL	10μH
		L4	QQL29BJ-100Z	COIL	10μH

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		L5	QQL29BJ-100Z	COIL	10μH
		L12	QQR0967-001	COIL	12μH
		L13	QQL071J-330Y	COIL	33μH
		L22	QQL231J-1R0Y	COIL	1μH
		L24	QQL071J-270Y	COIL	27μH
		L27	QQL071J-330Y	COIL	33μH
		L28	QQL071J-680Y	COIL	68μH
		L201	QQL29BK-1R0Z	COIL	1μH
		L202	QQL071J-330Y	COIL	33μH
		L203	QQL29BJ-220Z	COIL	22μH
		L204	QUY153-050Y	IM BUS WIRE	
		L206	QQL071J-220Y	COIL	22μH
		L207	QUY153-050Y	IM BUS WIRE	
		L2001	QUY153-050Y	IM BUS WIRE	
		L2251	QQL29BJ-100Z	COIL	10μH
		L2252	QQL29BJ-151Z	COIL	150μH
		L3101	QQL29BJ-100Z	COIL	10μH
		L5201	PELN1184	COIL	33μH
		L5202	PELN1184	COIL	33μH
		L6001	QQL29BK-1R0Z	COIL	1μH
		L6003	QQL29BJ-470Z	COIL	47μH
		L7101	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		L7102	NQL092M-R22X	COIL	0.22μH
		L7105	QQL231J-1R0Y	COIL	1μH
		L7106	QQL231J-1R0Y	COIL	1μH
		L7107	QQL01BJ-100Z	COIL	10μH
		L7108	QUY153-050Y	IM BUS WIRE	
		L7109	QQL231J-R22Y	COIL	0.22μH
		L7201	QQL01BJ-101Z	COIL	100μH
		X1	QAX0576-001Z	CRYSTAL RESONATOR	
		X3001	QAX0444-001	CRYSTAL RESONATOR,J680EK/J785EK	
			QAX0445-001	CRYSTAL RESONATOR,J680EU/J780EU	
		X3002	QAX0527-001	CRYSTAL RESONATOR	
		X6701	QAX0443-001	CRYSTAL RESONATOR	
		S3001	QSW0602-004	PUSH SWITCH,REC SAFETY	
		S7001	QSW0456-002Z	TACT SWITCH,STAND-BY	
		S7002	QSW0456-002Z	TACT SWITCH,CH-,J680EK/EU	
			QSW0456-002Z	TACT SWITCH,TIMER,J785EK	
			QSW0456-002Z	TACT SWITCH,A.DUB,J780EU	
		S7004	QSW0456-002Z	TACT SWITCH,REC	
		S7006	QSW0456-002Z	TACT SWITCH,PAUSE	
		S7008	QSW0456-002Z	TACT SWITCH,STOP/EJECT	
		S7010	QSW0456-002Z	TACT SWITCH,SAT.TIMER,J680EK/EU	
			QSW0456-002Z	TACT SWITCH,PLAY,J780EU/J785EK	
		S7012	QSW0456-002Z	TACT SWITCH,PLAY,J680EK/EU	
			QSW0456-002Z	TACT SWITCH,E.PROG,J780EU/J785EK	
		S7014	QSW0456-002Z	TACT SWITCH,REW,J680EK/EU	
		S7015	QSW0456-002Z	TACT SWITCH,FF,J680EK/EU	
		S7016	QSW0456-002Z	TACT SWITCH,CH+,J680EK/EU	
			QSW0456-002Z	TACT SWITCH,SAT.TIMER,J780EU/J785EK	
		K2001	NQL103K-R10X	COIL	0.1μH
		K2002	NQL103K-R10X	COIL	0.1μH
		K2003	NQL103K-R10X	COIL	0.1μH
		K2004	NQL103K-R10X	COIL	0.1μH
		K2251	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		K2252	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		K2253	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		K5101	QQR0678-001Z	FERRITE BEAD	
		K5102	QQR0678-001Z	FERRITE BEAD	
		K6080	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		K6701	NQR0200-003X	FERRITE BEAD	

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		K6702	NQR0200-003X	FERRITE BEAD	
		K6703	NQR0200-003X	FERRITE BEAD	
		K6704	NQR0200-003X	FERRITE BEAD	
		K6705	NQR0200-003X	FERRITE BEAD	
		K6706	NQR0200-003X	FERRITE BEAD	
		K7001	NQR0403-003X	FERRITE BEAD	
		PC3001	GP3S123	IC(PHOTO SENSOR)	
		PC3002	GP3S123	IC(PHOTO SENSOR)	
	⚠	PC5101	PS2561L1-1/L/	IC(PHOTO COUPLER)	
		T2051	PELN0832	OSC TRANSFORMER,J680EK/EU/J785EK	
			PELN0860	OSC TRANSFORMER,J780EU	
		T2052	PELN0861	OSC TRANSFORMER,J780EU	
	⚠	T5001	QQS0083-001	SW TRANSFORMER	
		TU6001	QAU0208-001	TUNER	
	⚠	TB1	LP20317-005A	TERMINAL BOARD(PAL),J680EK/EU/J785EK	
	⚠		LP20317-007A	TERMINAL BOARD(PAL),J780EU	
		DI7001	LTG-Y2K16M-J	LE DIODE	
		ET1	PQ21623-2-5	EARTH PLATE(RF)	
		HS1	LP40090-001A	HEAT SINK,Q5101	
		SD1	LP21033-001A	SHIELD CASE(PRE)	
		OT1	QYTDST3006Z	SCREW,Q5101	
		FC5001	QNG0006-001Z	FUSE CLIP,F5001	
		FC5002	QNG0006-001Z	FUSE CLIP,F5001	
		J7101	PEMC1104	RGB21PIN SOCKET,AV1	
		J7102	PEMC1104	RGB21PIN SOCKET,AV2	
		J7103	QNN0292-003	PIN JACK	
		J7105	QNN0381-002	PIN JACK,FRONT IN,J780EU	
	⚠	LF5001	PELN1204-01-01	LINE FILTER	
	⚠	LF5002	QQR0978-001	LINE FILTER	
		CN1	QGF1028C1-11	FPC CONNECTOR,(1-11)U.DRUM	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGF1207C1-05	FPC CONNECTOR,(1-5)DRUM MDA	
		CN3002	QGB2532J1-02	CONNECTOR,(1-2)LOADING MOTOR	
		CN3003	QGB2015M2-08	CONNECTOR,(1-8)CAPSTAN MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)ROTARY ENCODER	
	⚠	CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
		CN7001	QGF1207C1-09	FPC CONNECTOR,(1-9)FRONT,J780EU/J785EK	
	⚠	CP4001	ICP-N25	CIRCUIT PROTECTOR	
	⚠	CP5302	ICP-N25	CIRCUIT PROTECTOR	
	⚠	F5001	QMF51E2-2R0J1	FUSE	T2.0A,AC250V

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A/C HEAD BOARD ASSEMBLY <12>

	PW1	LP10122-01A1	A/C HEAD BOARD ASSY
	CN1	QGF1208F1-07	FPC CONNECTOR

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ADV.JOG BOARD ASSEMBLY(HR-J780EU/J785EK) <38>

	PW1	LPA20013-01B	ADV.JOG BOARD ASSY
	UN7001	QSW0905-001	ROTARY ENCODER
	CN7003	QGF1209F1-09	FPC CONNECTOR,(1-9)MAIN

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	

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LOADING MOTOR BOARD ASSEMBLY <55>

	PW2	LP10122-01A2	LOADING MOTOR BOARD ASSY
	CN1	QGB2533K1-02	CONNECTOR

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R.PAUSE BOARD ASSEMBLY(HR-J780EU)<91>

	PW3	LPA10131-01A3	R.PAUSE BOARD ASSY	
	R7167	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	J7108	PU60612	MINI JACK,R.PAUSE	
	CN7106	QUM022-18A4A4	PARA RIBON WIRE	

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SAT_CTL BOARD ASSEMBLY <92>

	PW4	LPA10131-01A4	SAT_CTL BOARD ASSY	
	R7166	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
	J7107	PU60612	MINI JACK,SAT_CTL	
	CN7104	QUM022-18A4A4	PARA RIBON WIRE	